



**NetMark  
Baseline Survey  
on  
Insecticide  
Treated Materials  
(ITMs)  
in Mozambique**

**May 2001**



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## **LIST OF ACRONYMS**

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<b>AED</b>	<b>Academy for Educational Development</b>
<b>ITMs</b>	<b>Insecticide treated materials</b>
<b>ITNs</b>	<b>Insecticide treated nets</b>
<b>RI</b>	<b>Research International</b>
<b>SES</b>	<b>Socio-economic status</b>
<b>UNICEF</b>	<b>United Nations' Children's Fund</b>
<b>USAID</b>	<b>United States Agency for International Development</b>
<b>USD</b>	<b>U.S. Dollars</b>
<b>WHO</b>	<b>World Health Organization</b>
<b>WRA</b>	<b>Women of reproductive age</b>

# MAP OF MOZAMBIQUE

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## EXECUTIVE SUMMARY

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- PURPOSE:** Provide baseline measures of
- Knowledge and beliefs about mosquitoes and malaria
  - Beliefs and attitudes about use of treated and untreated mosquito nets
  - Access, affordability, and ownership of mosquito nets
  - Net treatment practices
  - Use of nets and treated nets by vulnerable groups: children under five, pregnant women, and women of reproductive age
  - Consumer preferences regarding mosquito nets
  - Usage and attitudes regarding other mosquito control products

**METHODOLOGY:** Survey

**SAMPLE:** 999 households in Mozambique from 5 sites: Maputo, Beira, Quelimane, Tete, and Nampula. Target sample in each site was 200: 80 from urban households, 60 from households within 100km, and 60 from households 100-200 km from the urban center. Respondents were women aged 15-49 who were mothers/guardians of children under five years of age.

**DATA COLLECTION:** November 2000

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### STUDY FINDINGS:

#### Knowledge and beliefs about malaria and mosquitoes

Recognition of the Portuguese term for malaria—“paludismo”—was very high and knowledge of symptoms good; however knowledge of causes and vulnerable groups was somewhat low. Exposure to information about malaria prevention appears moderate and came mainly from radio and health services.

- Virtually all respondents (95%) reported having heard of the Portuguese term “paludismo.” Although the majority (77%) knew that mosquitoes cause malaria, only 30% knew that mosquitoes are the *only* cause of malaria. Sixty-eight percent (68%) mentioned fever as a symptom; most named other symptoms that are also manifestations of malaria. Few (3%), however, mentioned convulsions, a symptom of severe malaria. Only 58% knew that children under five and pregnant women are the groups most susceptible to severe malaria.
- Thirty-nine percent (39%) of respondents had not received any information about avoiding malaria in the past 12 months. Among the 61% who had received information about malaria prevention, the main sources of information were radio (59%) and health facilities (39% from posters and 30% from staff).

## Perceived advantages and disadvantages of net use

Levels of perceived advantages of net use by vulnerable groups—children under five and pregnant women—were very high, while levels of perceived disadvantages were very low. Nets were seen as providing good protection against mosquitoes and malaria and helping children sleep better. *Treated* nets were seen as especially effective, with the added advantage of killing and repelling mosquitoes. The small portions of respondents citing disadvantages of a child sleeping under a net were concerned with noise of mosquitoes, heat, and inconvenience. Most respondents said there were no disadvantages to treated nets. Those who did voiced concerns about the safety of the chemical and its smell.

- Almost all respondents (92%) perceived advantages for a child under five to sleep under a mosquito net. Most commonly mentioned were “avoid getting bitten by mosquitoes” (74%), “avoid getting malaria” (59%); and “to sleep better “ (28%).
- The majority of respondents (85%) did not cite any disadvantages to a child under five sleeping under a mosquito net. The most commonly mentioned disadvantages were that the “mosquitoes still make noise” (4%), “it is hot sleeping under a net” (4%), and “it takes time to tuck in the net each night” (3%).
- Most respondents (82%) perceived advantages for a child under five to sleep under a *treated* net. The most commonly mentioned were “kills mosquitoes” (48%), “repels mosquitoes away from the net” (48%), and “works better at preventing malaria” (29%).
- Most respondents (82%) did not cite any disadvantages for a child under five sleeping under a *treated* net. The most commonly mentioned had to do with concerns about the safety and smell of the chemical: “smell is bad” (7%); “chemical is dangerous” (5%); “causes irritation/cough” (5%); “chemical can kill child” (4%); and “child might chew/suck net” (4%).
- The majority of respondents (83%) perceived advantages for a pregnant woman sleeping under a *treated* net. The most commonly mentioned were “kills mosquitoes” (44%), “works better against mosquitoes than a net that has not been treated” (33%), that the “pregnant woman is more protected “ (30%), and that “it is better at preventing malaria” (30%).
- Seventy-eight percent (78%) did not cite any disadvantages for a pregnant woman sleeping under a *treated* net. The most common disadvantages that were mentioned had to do with safety and smell issues: “might make woman nauseated/vomit” (9%); “chemical is dangerous” (7%); “smell is bad” (7%); “causes irritation/cough” (6%)’ and “chemical can kill fetus/cause miscarriage” (5%).

## Access to mosquito nets

Nets were available through different outlets, with markets and general shops being reported as the most accessible. Consumers said they would have to travel varied amounts of time to find nets. Over one-quarter of respondents said that nets are not available or that they did not know where to get one.

- The nearest places where a mosquito net could be bought were open air/structured markets (39%) and general shops (16%). The average time to get to the nearest place of purchase was approximately ½ hour by foot or 1 ¼ hour by bus.
- Overall 28% of respondents — representing over one-third (35%) of those in rural areas — reported that mosquito nets are not available or that they did not know where to get them.

## Mosquito net ownership, treatment, and use

Net ownership in the study sites was moderate. Nets had been obtained mostly from commercial outlets but from some non-commercial sources as well. Non-owners said that the main reason they did not own a net was cost. Use of nets by vulnerable groups was somewhat low, and nets were not used year-round. Awareness of treatment of nets with insecticide was low and relatively few people treated their nets. The proportion of people most vulnerable to malaria sleeping under any nets and treated nets in net-owning households was moderate.

- Twenty-seven percent (27%) of households reported owning one or more mosquito nets. Thirty-eight percent (38%) of net-owning households owned more than one mosquito net. (These figures may be higher than the national average, given that the Maputo and Quelimane sample sites have active net promotion projects). Ownership was higher in urban (34%) than rural (22%) areas and households of higher socio-economic status (SES) were more likely to own a net than households of lower SES.
- A minority of households (28%) had heard of treating mosquito nets with insecticide solution. Seven percent (7%) of households owned a treated mosquito net. Urban households and those with higher SES were more likely to be aware of net treatments and to own a treated net than rural and lower SES households. Twenty-six percent (26%) of nets were treated: 18% of nets were pretreated before purchase while 19% were treated/re-treated after purchase. On average, nets had been treated/re-treated 1.7 times since purchase, and were last treated 3.7 months ago.
- Net treatment was generally obtained from both commercial (50%) and non-commercial (13%) sources: markets (17%), general shops (16%), and clinics (12%). For 33% of treated nets, respondents did not know where the treatment was obtained. Respondents were generally unaware of what product was used to treat the net.
- About half (48%) of children under five in net-owning households slept under a net (treated or untreated) the prior night, representing 13% of all children under five in the households in the sample. Only 14% of children under five in net-owning households slept under a *treated* net the prior night, representing 4% of all children under five in the households in the sample. The proportion of net-owning households where all children under five slept under any net decreased the more children the household had.
- Forty-six percent (46%) of women of reproductive age (WRA) in net-owning households slept under a net (treated or untreated) the prior night, representing 13% of the total number of WRA in the households in the sample. Only 14% of WRA in net-owning households slept under a *treated* net the prior night, representing 4% of WRA in the households in the total sample.
- Fifty-six percent (56%) of pregnant women in net-owning households slept under a net the prior night, representing 19% of pregnant women in the households in the total sample. Only 17% of pregnant women in net-owning households slept under a treated net the prior night, representing 6% of all pregnant women in the sample households. (The denominators for pregnant women, however, were very small.)
- For those household members who did sleep under mosquito nets the average number of months per year they slept under nets was 6.
- Two people, on average, usually slept under a large net.
- The vast majority of non-net owners (84%) said they did not own a net because they did not have enough money. Percentages were higher in rural (85%) than in urban (79%) areas.

## Characteristics of nets owned

The vast majority of nets were obtained from commercial sources. Over forty percent of all nets were purchased in a market. The average price of a net was 11 USD. The majority of nets had been acquired within the past two years. Most were round/conical and double sized. Nets are commonly unbranded products; consumers were unaware of the brand. The majority of nets were reportedly washed at least once a month.

- Forty-four percent (44%) of nets were purchased in a market; 12% from street vendors; 12% from general shops; 6% from textile shops; 5% from projects; 4% as gifts; and 3% from clinics. A higher percentage of nets in lower SES households were purchased from non-commercial sources (e.g., projects, clinics) than nets in higher SES households. The vast majority (83%) of nets owned by households were acquired within the past 2 years.
- Households reported paying an average of 11 USD per net (conversion based on the exchange rate for the dollar on the date of data collection).
- Owners did not know the brand name for the almost all nets (93%).
- The most common net sizes owned were double (53%) and king (23%). The most common shapes were round/conical (59%) and rectangular (35%).
- Sixty-nine percent (69%) of nets had been washed. The majority (68%) of washed nets were reportedly washed at least once a month, with almost one-third (30%) of nets being washed weekly.

## Consumer mosquito net preferences

- Households, whether net-owning or not, generally preferred round/conical, king size, light-colored nets.
- Over half (56%) of the respondents preferred round/conical nets. Thirty-three percent (33%) preferred rectangular nets. Preferred net sizes were king (54%) and double (37%).
- Twenty-nine percent (29%) of the respondents preferred white mosquito nets; 18% pink; 16% light blue; and 13% light green. The majority (66%) disliked black nets; 29% dark green; 27% white; 19% pink; and 17% dark blue.

## Awareness, use, and price of mosquito control products

Mosquito nets, aerosol insecticides, and coils were the mosquito control products that consumers were most aware of. Use of aerosols and coils, however, was fairly low. The consumers who did purchase these products tended to purchase them frequently, mostly from markets and general shops.

- Awareness (unprompted) of mosquito control products was highest for mosquito nets (63%), aerosols (45%), and mosquito coils (42%). The most frequently used commercial products were aerosols (26%) and mosquito coils (25%). (These figures may be low, given that “use” was asked only of those who indicated that they were aware of a given product.) Use of commercial mosquito control products was higher in urban than in rural areas.
- The average reported prices for 180-220 ml can of aerosol insecticide was 1.72 USD and for a 300-350 ml can 2.10 USD; and 0.24 USD for a single mosquito coil. Almost half (49%) of households that had purchased mosquito coils in the past 12 months prior to the interview did so within the last 7 days. Almost two-thirds (62%) of households that had purchased aerosols did so within the last month. Coils were purchased mostly in markets (61%). Aerosols were most frequently purchased in general shops (40%) and markets (32%).

## Perceptions of mosquito control attributes, products, and brands

Consumers wanted a mosquito control product that kills mosquitoes and other insects and reduces malaria. Among all insect control products, nets were rated most highly among consumers on the majority of positive mosquito control attributes, except “killing mosquitoes and other insects,” “being good value for the money,” and “being a good quality and effective brand.” Consumers were most aware of the Baygon brand and associated it with insect control attributes they value, except being safe around children, for which the majority of respondents associated no brand.

- On a scale from 1-7, respondents said that the most important attributes of mosquito control products were “kills mosquitoes” (6.17), “kills other insects, other than mosquitoes” (5.75), and “reduces malaria (5.37).
- Respondents rated mosquito nets more highly than all other insect control products on the majority of insect control attributes including, “keeps mosquitoes away for a long time” (53%), “keeps mosquitoes away while sleeping” (70%), “is safe to use around children (55%), “is a long-term solution to mosquito problems” (43%), and “reduces malaria” (45%). Aerosols were most strongly associated with “kills mosquitoes” (88%), “kills other insects, other than mosquitoes” (78%), and being “a high quality/effective brand” (42%). Coils were seen as being the best “value for the money” (33%).
- Brand awareness was highest for Baygon (84%) and Doom (46%). Baygon was most associated with the positive insect control attributes consumers value.

### **PROGRAM/PRODUCT IMPLICATIONS:**

A number of factors make this a favorable setting for ITM promotion and sales, but efforts are needed to increase availability and access to ITMs, to overcome some negative perceptions of nets and net treatments, to increase awareness of ITMs, and to stimulate product demand.

Favorable factors include:

- high awareness of malaria and some general understanding of how it is transmitted;
- favorable attitudes toward mosquito nets compared to other insect control products;
- strong valuing of product attributes that ITMs deliver;
- high level of perceived advantages and low level of perceived disadvantages of net use by vulnerable groups;
- a growing net culture – about one-fourth of households already own at least one net and the majority were acquired in the last two years; and
- evidence of higher rates of net ownership where they have been promoted.

Main barriers to overcome for ITM promotion are:

- high cost and limited access to nets;
- lack of variety in net size, shape and color;
- some negative perceptions of nets;
- concerns regarding the safety and potential adverse health effects of treated nets, particularly with regard to young children and pregnant women;
- low level of ITM awareness;
- inadequate use of ITMs by young children and pregnant women;
- inadequate net treatment practices, including lack of regular treatment and re-treatment of nets;
- lack of strong branding of nets and insecticide treatments;
- only moderate exposure to malaria prevention messages;
- misperceptions about the causes of malaria; and
- misperceptions of persons most susceptible to severe malaria.

# SECTION 1

## INTRODUCTION

---

### 1.1 BACKGROUND

#### The Problem of Malaria

Malaria is a growing health problem in Africa. Each year, 300-500 million people worldwide suffer from the disease, with 9 out of 10 cases occurring in sub-Saharan Africa (WHO, 1998). Malaria kills at least 1 million people each year and the vast majority of deaths occur among children less than five years of age. In Africa, one out of twenty children is likely to die of a malaria-related illness before his fifth birthday (WHO, 1999). Pregnant women are also particularly susceptible to the disease. Malaria during pregnancy causes severe anemia, miscarriages, stillbirths, and maternal deaths, and may account for up to 40% of preventable low birth weight among newborns in endemic areas (Brabin, 1991; UNICEF, 1999). Malaria places a staggering economic burden on already strained national economies and on struggling families. The disease cost sub-Saharan African nations more than 2 billion USD in 1997 (WHO, 1998) and has slowed economic growth in Africa by up to 1.3% each year (Gallup & Sachs, 2000). In addition, malaria reduces human work capacity and productivity, and affects social development indicators such as child health and school attendance (Global Forum for Health Research, 2000).

Consistent use of mosquito nets and curtains that have been treated with insecticide—insecticide treated materials, or ITMs—has been proven effective in reducing malaria. Current data indicate that ITM use can prevent 19% of child deaths from all causes, with some country-specific studies in Africa suggesting that as much as 42% of all-cause mortality among children under-five can be averted. Additionally, malaria morbidity in children under five has been shown to decrease by as much as 21-72% when ITMs are used (Lengeler, 1998).

To date, however, few families in Africa have mosquito nets and there has been little consumer marketing and distribution of ITMs in most African countries. Where they have been marketed (e.g., Tanzania and The Gambia), their supply has been limited and often donor-organized and subsidized. Currently, many households use other anti-mosquito measures such as coils and aerosol sprays to prevent nuisance biting, but the efficacy of these products in preventing malaria remains unknown.

#### NetMark

NetMark is a United States Agency for International Development (USAID)-funded effort to promote the use of ITMs to prevent malaria in sub-Saharan Africa through the formation of public-private partnerships. Managed and carried out by the Academy for Educational Development (AED), the NetMark partnership includes, in addition to AED, the U.S. government, The Malaria Consortium of the London School of Hygiene and Tropical Medicine & the Liverpool School of Tropical Medicine, The Johns Hopkins School of Hygiene and Public Health, and Group Africa. The primary goal of NetMark is to develop a sustainable market for ITMs, especially mosquito nets (bednets), in target countries in Africa. The main objectives of the project are to increase the proportion of households that own ITMs, increase nightly use of treated nets, especially by those most vulnerable to malaria (pregnant women and children under five years of age); and increase the proportion of net owners who regularly re-treat their nets with insecticide.

## 1.2 SURVEY OBJECTIVES, SAMPLE, AND IMPLEMENTATION

### Objectives

As part of a comprehensive research agenda that includes both market and behavioral research, NetMark conducted a household survey in Nigeria, Zambia, Uganda, Senegal, and Mozambique to serve as an evaluation baseline. The baseline survey was to provide quantitative information useful to the public health community as well as to the private sector. Specifically, the objectives of the survey were to provide data on:

- Knowledge and beliefs about mosquitoes and malaria
- Beliefs and attitudes about use of treated and untreated mosquito nets
- Access, affordability, and ownership of mosquito nets
- Net treatment practices
- Use of nets and treated nets by vulnerable groups: children under five, pregnant women, and women of reproductive age
- Consumer preferences regarding mosquito nets
- Usage and attitudes regarding other mosquito control products

In addition, the baseline survey information will supplement the NetMark qualitative research findings to inform the development of insecticide and net products and to design regional promotional campaigns encouraging the purchase and correct use of these products.

The same instrument was used in each of the five countries in order to ensure comparability of data. This document reports on findings from Mozambique. Reports on the other four countries are available from NetMark.

### Sample

This survey was conducted among 999 households in Mozambique with women aged 15-49 who were mothers or guardians of children under five years of age. The sample was drawn from 5 sites: Maputo, Beira, Quelimane, Tete, and Nampula. In each site, the target sample was 200: 80 respondents from the urban center, 60 from households within 100 kilometers from the urban center, and 60 from households 100-200 kilometers from the urban center. The actual sample distribution attained is shown in Table 1.

Table 1: Distribution of sample among sites

Site	Total	Urban	Rural 100 km from Urban	Rural 200 km from Urban
Maputo	204	81	63	60
Beira	199	79	60	60
Quelimane	200	80	60	60
Tete	199	80	59	60
Nampula	197	80	58	59
<b>TOTAL</b>	<b>999</b>	<b>400</b>	<b>300</b>	<b>299</b>

A multistage sampling procedure was used to select the respondents participating in the survey, as follows:

*1- Selection of primary sampling units:* Purposive sampling was used to select five sites across the country that reflected the geo-ethnic diversity of the population. (See Table 2.)

*2- Selection of sampling points:* Within each of the five sites, 20 sampling points (villages or urban neighborhoods) were randomly selected from the Electoral Commission's list of Electoral Unit Areas using quota sampling: 8 from

within the city (“urban”); 6 from within 100 kilometer radius from the city (“near rural”); and 6 from within a 100-200 kilometer radius from the city (“far rural”). This stratification scheme was designed to meet the purposes of the evaluation. Since a key objective of NetMark is to increase access to ITMs across the socio-economic spectrum, it was essential to include urban centers with the potential to be reached by product distribution systems, as well as include households located at varying distances from the urban center.

*3- Selection of households:* Ten interviews were conducted per sampling point, each in a different household. For each sampling point, a starting point (a fixed landmark or address) and the direction from which to start the data collection were chosen. Interviewers were instructed to go to the starting point and walk in the chosen direction until they located a residence with a qualified respondent. After a successful interview, interviewers were instructed to skip five residences (or less if residences were far apart) and seek another qualified respondent.

*4- Selection of eligible respondents:* An eligible respondent for the evaluation was a female 15-49 years old who was the parent or guardian of a child under five years old, i.e., aged 0-4. Females aged 15-49 were selected to maximize the sample size for calculating the proportion of females of reproductive age sleeping under a net. Similarly, only those women who had a child under five were included, to maximize the sample size for calculating the proportion of children under five sleeping under a net.

This sampling procedure was designed to meet the purposes of this study. In the interest of cross-national comparability, the procedure was standardized across all five countries surveyed. In Mozambique, the sampling strategy resulted in an urban-rural breakdown that approximates the national proportions: this sample is 40% urban and 60% rural, and data from World Urbanization Prospects (United Nations, 1994) found that Mozambique was 34% urban and 66% rural. It is likely that there has been some shift to urban areas since 1994.

In other ways, however, the sampling procedure devised for this study may have resulted in a sample that differs from a true national random sample (which was neither desirable nor feasible in this case):

- a) Net promotion activities in or near the study sites may have resulted in net ownership rates that are higher than those that would have been obtained by a true national random sample. For example, there was a project to promote treated nets in Boane, near the capital city of Maputo. Population Services International (PSI) is promoting ITNs in Mocuba, which is in the vicinity of Quelimane, a major city that is also included as a site in this study.
- b) Only households with children under five were included in the sample, and the extent to which these households differ from other households with respect to the variables measured is not known.
- c) Only women of reproductive age were selected as respondents. Responses from men or from older women may differ from those of the women in the sample.

Table 2: Study sites, location and main ethnic/language groups

Site	State	Ethnic Group/Language
Maputo	Maputo	Tsonga/Ronga
Beira	Sofala	Sena and Ndau
Quelimane	Zambezia	Chuabo and Macua
Tete	Tete	Nhungwe
Nampula	Nampula	Macua

## Implementation

The research was carried out by NetMark and the Africa offices of Research International (RI). NetMark staff developed the survey instrument (survey) based on project qualitative research and a review of existing instruments on ITMs; subsequently, the draft was reviewed by colleagues from RI as well as from collaborating institutions and countries. NetMark and RI jointly conducted nearly a week of instrument pre-testing in Zambia in September 2000. In October, RI trained local Mozambican data collectors, and thereafter managed the implementation of the survey. The data were collected during November 2000.

To maximize comparability of data, the surveys were administered in all five countries (Nigeria, Senegal, Zambia, Uganda, and Mozambique) more or less simultaneously, during October and November of the year 2000. It should be noted, however, that the timing of the rainy season differs by country, and is likely to affect net use patterns. In Mozambique, the timing of the study meant that the data were collected during the beginning of the wet season.

### 1.3 ORGANIZATION OF THE REPORT AND TABLES

After describing the sample, this report presents findings grouped into three main areas: knowledge and beliefs about mosquitoes and malaria; mosquito nets; and other mosquito control products. Implications of the findings are discussed in the final section.

This report attempts to present a large amount of data in a standard and accessible way. It includes a complete set of tables to serve as a data resource, and each table is accompanied by statements summarizing the main results. Each of the five country reports contains the same set of tables, for purposes of comparability.

In most of the tables in this report, data are broken down in several ways:

- By **site**: the five primary sampling areas (i.e. Maputo, Beira, Quelimane, Tete, and Nampula), each of which includes both urban and rural areas
- By **location**: a refined urban-rural breakdown, which distinguishes between respondents in Maputo proper, those in the four other urban centers, those living in “near rural” areas (within 100 km from the urban center) and those living in “far rural” areas (100-200 km from the urban center).
- By **urban-rural**: all urban respondents across sites compared with all rural (both “near rural” and “far rural”) respondents across sites.

Some variables are also broken down by socio-economic status (SES). A description of the variables in the SES scale and of the procedure used to develop the scale is found in Section 2, which follows.

Results are presented in percentages, unless otherwise stated. Each table indicates whether percentages are based on the entire sample or on a sub-group. Base figures (denominators) are given as absolute numbers.

## SECTION 2

### CHARACTERISTICS OF RESPONDENTS AND HOUSEHOLDS

This section provides descriptive information on respondents and households in the sample. It also provides information on socio-economic status (SES) variables, which were combined to create a five-point SES scale.

The scale was calculated as follows: Categorical variables were re-coded to become pseudo-ordinal variables, and categories that were judged to be equivalent in terms of SES were combined to increase the frequency of responses. Principal component analysis was used to extract the main, single factor that accounted for the largest amount of variance in the data. Using the factor scores from the principal component analysis, respondents were divided into 10 groups based on the deciles of the factor scores. To assure adequate cell sizes, these ten groups were collapsed into a five point scale, so that each SES level has approximately 20% of the sample in it. In this scale, "1" indicates the lowest SES group and "5" indicates the highest.

#### 2.1 CHARACTERISTICS OF RESPONDENTS

Table 3: Characteristics of respondents  
Among all respondents

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599
<b>Age of Respondent</b>												
15-19	9.1	11.3	8.5	10.5	9	6.1	8.6	5.6	8.7	13.4	6.3	11
20-29	48.3	53.4	50.8	50.5	42.7	44.2	58	48	41.7	52.8	50	47.2
30-39	29.1	26.5	29.6	23	30.7	36	27.2	35.7	28.7	23.1	34	25.9
40-49	13.3	8.8	11.1	16	17.1	13.7	6.2	10.7	21	10.4	9.8	15.7
<b>Education Level of Respondent (years)</b>												
0	25.3	10.3	25.1	21.5	31.2	39.1	6.2	14.4	31.3	36.1	12.8	33.7
1-5	31.5	30.9	34.2	32	38.2	22.3	23.5	23.5	39.3	34.4	23.5	36.9
6-12	41.3	52.5	40.2	45.5	30.7	37.6	56.8	61.8	29	27.8	60.8	28.4
13+	1.5	5.9	0.5	1	0	0	13.6	0.3	0.3	0.7	3	0.5
Mean (among those with schooling)	6.34	7.16	5.99	6.46	5.35	6.5	8.43	7.19	5.26	5.43	7.46	5.34
<b>Language of Interview</b>												
Portuguese	90.7	84.8	96	97	100	75.6	90.1	99.1	86.3	86.3	97.3	86.3
Other/mixed	9.3	15.2	4	3	0	24.4	9.9	.9	13.7	13.7	0.7	13.7

#### 2.2 CHARACTERISTICS OF HOUSEHOLDS

Table 4: Household composition

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599
Number of household members per household (mean)	5.71	5.81	5.75	5.49	5.96	5.55	5.79	5.65	5.66	5.82	5.68	5.74
Number of women of reproductive age in household per household (mean)	1.55	1.77	1.59	1.39	1.5	1.51	1.93	1.65	1.46	1.44	1.71	1.45
Number of children under age 5 per household (mean)	1.58	1.53	1.69	1.57	1.63	1.5	1.4	1.48	1.61	1.72	1.46	1.66

Table 5: Age distribution of household members

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	5709	1185	1145	1099	1187	1093	469	1801	1698	1741	2270	3439
0	3.4	4.3	2.6	2.9	2.1	4.9	4.5	2.9	2.7	4.2	3.3	3.4
1	3.7	4.1	3.1	2.8	4.5	3.9	3.4	3.1	3.8	4.3	3.1	4.1
2	5.5	4.8	7.2	6.2	5.5	3.8	4.5	5.2	6.1	5.6	5	5.8
3	5.7	4.9	5.9	6.3	5.6	5.9	5.8	5.9	5.6	5.6	5.9	5.6
4	6.0	5.2	6.9	6.6	6.1	5.2	4.3	6	6.4	6.1	5.6	6.3
5-14	25.1	21.6	25.5	25.3	29	24.2	17.9	25.2	25.5	26.5	23.7	26
15-49	45.7	50.5	46.4	41.9	43.4	45.8	55.7	48.5	43.8	41.9	50	42.8
50+	4.9	4.4	2.8	7.9	3.8	6	4.1	3.3	6.1	5.7	3.5	5.9

## 2.3 SOCIO-ECONOMIC DESCRIPTORS

Table 6: SES indicators

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599
<b>Employment of main wage earner</b>												
Regular	52.8	82.8	55.3	46.5	33.7	44.7	86.4	66.8	41.3	40.1	70.8	40.7
Seasonal	20.4	9.3	21.6	26	40.2	5.1	11.1	14.1	26	24.1	13.5	25
Casual	25.1	6.9	20.6	24	26.1	48.7	2.5	17.2	31	33.8	14.3	32.4
Don't Know	1.7	1	2.5	3.5	0	1.5	0	1.9	1.7	2	1.5	1.8
<b>Main wage earner's years of schooling</b>												
0	11.6	4.9	10.1	8	11.6	23.9	0	6	15.3	17.1	4.8	16.2
1-5	18.8	24.5	13.6	19	22.6	14.2	21	11.6	22.7	22.1	13.5	22.4
6-12	45.4	46.1	43.2	51.5	44.2	42.1	40.7	58.9	40.3	37.5	55.3	38.9
13+	2.2	7.8	0.5	2.5	0	0	16	0.9	1	1	4	1
Don't Know	21.9	16.7	32.7	19	21.6	19.8	22.2	22.6	20.7	22.4	22.5	21.5
<b>Household items</b>												
Electricity	36.6	59.3	23.1	38.5	23.1	38.6	77.8	58.6	17.7	21.1	62.5	19.4
A radio	76.2	83.8	70.4	84	66.3	76.1	91.4	87.5	71.3	64.9	88.3	68.1
A television	26.0	51.5	18.6	28.5	10.6	20.3	77.8	42.6	9.7	10.7	49.8	10.2
A telephone/Cell phone	7.1	14.2	1.5	10	3	6.6	30.9	12.2	1.3	1	16	1.2
A refrigerator	16.0	38.7	9	17	8	6.6	59.3	20.7	7.7	7.7	28.5	7.7
A bicycle	33.5	24	33.2	49.5	40.7	20.3	17.3	29.8	36.3	39.1	27.3	37.7
A motorcycle	5.0	3.4	5.5	8.5	4.5	3	4.9	7.5	3	4.3	7	3.7
A car or truck	7.1	16.7	4.5	8.5	3.5	2	19.8	9.1	4	4.7	11.3	4.3
An animal-drawn plough	1.2	2.9	1.5	0	1.5	0	0	0.6	1.7	1.7	0.5	1.7
Windows with mosquito screens	20.3	45.1	12.1	19.5	10.1	14.2	63	21.9	16.7	10.7	30.3	13.7
<b>Energy source for cooking</b>												
Electricity	8.9	18.1	9	12	2.5	2.5	38.3	14.1	3	1.3	19	2.2
LPG/natural gas	2.5	10.3	1	0	1	0	16	1.3	1.3	1.3	4.3	1.3
Biogas	0.2	0.5	0.5	0	0	0	1.2	0.3	0	0	0.5	0
Kerosene/Paraffin	2.9	12.3	1.5	0.5	0	0	13.6	0.9	4	1	3.5	2.5
Coal/lignite	5.2	6.4	11.6	5	2	1	1.2	5.3	8.7	2.7	4.5	5.7
Charcoal	37.9	35.8	43.2	42	19.1	49.7	25.9	54.9	28	33.1	49	30.6
Firewood/straw	42.0	16.2	32.7	40.5	75.4	46.2	3.7	22.9	54.3	60.5	19	57.4
Dung	0	0	0	0	0	0	0	0	0	0	0	0

Table 6: SES indicators (continued)

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Queli- mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599
<b>Source of drinking water</b>												
Piped Water												
Piped into home or plot	29.7	42.2	19.1	30	19.6	37.6	63	52.7	13.7	12.4	54.8	13
Public tap	36.1	51	40.2	24.5	41.7	22.8	37	29.8	40	38.8	31.3	39.4
Well water												
Well in residence/plot	3.8	1	9	1.5	1	6.6	0	3.8	6.3	2.3	3	4.3
Public shallow well	7.3	0.5	3	21.5	3.5	8.1	0	2.5	11	10.7	2	10.9
Public bore hole	13.6	4.4	18.6	19	18.6	7.6	0	11.3	14.7	18.7	9	16.7
Surface Water												
Spring	0.4	0	0	0.5	0	1.5	0	0	0.7	0.7	0	0.7
River/stream	8.6	0.5	10.1	3	15.6	14.2	0	0	12.3	16.4	0	14.4
Pond/lake	0.1	0	0	0	0	0.5	0	0	0.3	0	0	0.2
Tanker truck	0	0	0	0	0	0	0	0	0	0	0	0
Rainwater	0	0	0	0	0	0	0	0	0	0	0	0
<b>Sanitation facility</b>												
Flush toilet												
Own flush toilet	21.4	29.4	19.6	26.5	13.6	17.8	40.7	40.8	8.7	8.4	40.8	8.5
Shared flush toilet	2.4	4.9	2.5	1	1.5	2	4.9	2.8	1.3	2.3	3.3	1.8
Pit toilet/latrine												
Traditional pit latrine	46.7	54.4	46.7	40	40.7	51.8	37	30.1	56.3	57.5	31.5	56.9
Ventilated improved pit latrine	11.4	11.3	16.1	8	12.1	9.6	17.3	18.2	9.7	4.3	18	7
No facility/bush/field	16.3	0	13.6	23	31.7	13.7	0	7.2	22.7	24.1	5.8	23.4
Other												
In the Sea/River	0.2	0	1	0	0	0	0	0.3	0.3	0	0.3	0.2
<b>Main material of floor</b>												
Natural floor												
Earth/sand	47.7	13.2	51.3	53	66.8	55.3	1.2	27.6	64.3	65.2	22.3	64.8
Dung	0.3	0	0	1	0.5	0	0	0	0.3	0.7	0	0.5
Rudimentary floor												
Wood planks	0.3	0	1.5	0	0	0	0	0.6	0.3	0	0.5	0.2
Palm/bamboo	0	0	0	0	0	0	0	0	0	0	0	0
Finished floor												
Parquet or polished wood	7.5	15.2	5	6.5	5	5.6	32.1	12.9	2.3	0.3	16.8	1.3
Vinyl or asphalt strips	0	0	0	0	0	0	0	0	0	0	0	0
Ceramic tiles	2.7	2	2.5	6.5	1	1.5	1.2	5.6	1.7	1	4.8	1.3
Cement	40.8	67.6	39.7	32.5	26.1	37.6	64.2	53.3	30.3	31.8	55.5	31.1
Carpet (not loose or scattered)	0.1	0.5	0	0	0	0	1.2	0	0	0	0.3	0
Other	0.1	0	0	0.5	0	0	0	0	0	0.3	0	0.2

Table 7: Distribution of SES levels

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Queli- mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599
1 (N = 199) LOW	19.9	2.5	18.6	19.5	32.7	26.9	0	5.3	27.7	33.1	4.3	30.4
2 (N = 200)	20.0	6.4	20.6	30	27.6	15.7	0	11.9	26.7	27.4	9.5	27
3 (N = 200)	20.0	17.2	31.7	13.5	15.6	22.3	11.1	22.6	22.7	17.1	20.3	19.9
4 (N = 201)	20.1	34.3	14.6	13	15.6	22.8	22.2	27.9	16	15.4	26.8	15.7
5 (N = 199) HIGH	19.9	39.7	14.6	24	8.5	12.2	66.7	32.3	7	7	39.3	7

## SECTION 3

### KNOWLEDGE AND BELIEFS ABOUT MALARIA AND MOSQUITOES

The study sought to find out whether respondents had heard of the Portuguese term for malaria (“paludismo”), what their level of knowledge about the symptoms and causes were, whether they knew what groups are most vulnerable to severe malaria, and whether they had received any information on avoiding malaria within the past year. Respondents were also asked when they are most bothered by mosquitoes.

#### 3.1 RECOGNITION OF TERM “PALUDISMO”

Respondents were asked whether they had heard of the Portuguese term “paludismo” in order to find out the extent to which the term can be used in promotion activities. Use of a single term around which promotion activities could take place would be important in building common, accurate understanding of the term.

- Recognition of the term was extremely high: virtually all respondents (95%) reported having heard of the Portuguese term “paludismo”.
- Recognition of the term “paludismo” was slightly higher among urban (99%) than rural (93%) areas and decreased with distance from the urban centers.

Table 8: Recognition of Portuguese term for malaria: “paludismo”  
Among all respondents

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599
Yes	95.3	99.5	91.5	98	93.5	93.9	98.8	98	95.3	91	98.5	93.2
No	4.7	0.5	8.5	2	6.5	6.1	1.2	1.6	4.7	9	1.5	6.8

#### 3.2 PERCEIVED SYMPTOMS AND CAUSES OF MALARIA

Malaria can exhibit a diverse set of symptoms, but fever is common to all symptomatic cases. In order to determine the extent to which respondent perceptions of malaria coincided with the biomedical concepts of the illness, respondents were asked what the symptoms and causes of malaria were.

- Most respondents mentioned fever or its manifestations: the main symptoms mentioned were “fever/hot body” (68%), “headache” (52%), “body ache or joint pain/general pain” (31%), and weakness (26%). Only 3% mentioned “convulsions/fits”, a symptom of severe malaria.
- Most respondents who had heard of malaria knew that mosquitoes cause malaria (77%). However, only 30% named *only* mosquitoes as the cause; 53% erroneously believed that there were additional causes of malaria as well; 17% didn’t know the cause of malaria at all; and 6% thought malaria was caused only by factors other than mosquitoes. Most commonly-named causes other than mosquitoes were “dirty surroundings” (22%); “standing water” (18%); and “being in the rain” (13%). The percentage of respondents who didn’t know what caused malaria was higher in rural (22%) than in urban (10%) areas, increasing with distance from the urban center.

Table 9: Perceived symptoms of malaria

Among respondents who have heard of malaria (multiple responses possible)

	Site					Location				Urban/Rural		
	Total	Maputo	Beira	Queli- mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	952	203	182	196	186	185	80	314	286	272	394	558
Fever/hot body/temperature	68.4	63.5	62.1	70.4	71	75.1	72.5	74	65	64	73.6	64.7
Feeling cold/chills/shivering	34.7	38.4	40.7	26.5	30.1	37.8	50	35	33.9	30	38.3	32.1
Cough	5.1	5.9	3.8	3.6	9.7	2.7	8.8	3.5	6.3	4.8	4.6	5.6
Headache	51.6	81.3	50	45.9	42.5	35.7	75	43	52.8	53	49.5	53
Nausea or vomiting/vomiting yellow stuff	14.8	22.7	12.1	8.7	21.5	8.6	26.3	15	15.4	11	17.3	13.1
Diarrhea	13.3	14.8	9.3	11.7	14	16.8	15	13	12.9	13	13.7	13.1
Dizziness	6.5	10.3	13.2	5.1	3.8	0	16.3	7.3	7	2.2	9.1	4.7
Loss of appetite/can't eat	14.1	20.7	11	13.8	15.6	8.6	27.5	17	11.9	9.6	18.8	10.8
Body ache or joint pain/general aches	30.5	56.2	29.1	31.1	21.5	11.9	50	27	28.3	31	32	29.4
Pale eyes or palms	1.4	1	2.7	1	0.5	1.6	2.5	1.6	2.1	0	1.8	1.1
Convulsions/fits	2.7	6.9	2.2	1	2.7	0.5	10	1.9	2.1	2.2	3.6	2.2
Weakness	26.3	23.2	18.7	28.6	34.4	26.5	27.5	30	27.6	20	29.7	23.8
Other:												
Eye problems	0.1	0	0	0	0	0.5	0	0	0.3	0	0	0.2
Unhappy/crying child	0.1	0	0	0	0	0.5	0	0	0.3	0	0	0.2
Don't Know	4.4	1.5	8.2	2	2.7	8.1	1.3	3.2	4.5	6.6	2.8	5.6

Table 10: Perceived causes of malaria

Among respondents who have heard of malaria (multiple responses possible)

	Site					Location				Urban/Rural		
	Total	Maputo	Beira	Queli- mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	952	203	182	196	186	185	80	314	286	272	394	558
Mosquitoes/being bitten by mosquitoes	76.5	95.1	69.2	79.6	62.9	73.5	95	81	78	64	84	71.1
Being in the rain	12.8	15.8	9.3	14.3	4.8	19.5	26.3	13	13.3	8.1	15.7	10.8
Getting cold	4.9	5.4	4.4	7.7	4.3	2.7	10	4.1	5.6	3.7	5.3	4.7
Getting hot/sun overexposure	6	9.9	4.4	5.6	5.9	3.8	16.3	6.4	4.9	3.7	8.4	4.3
Drinking dirty water	4.8	11.8	2.7	2	2.7	4.3	12.5	3.8	5.9	2.6	5.6	4.3
Eating cold or dirty food	2.9	6.9	3.8	0	2.2	1.6	8.8	1.6	3.1	2.6	3	2.9
Overwork	1.3	1.5	3.3	0	1.6	0	2.5	1	0.7	1.8	1.3	1.3
God/Allah	0.9	0.5	0.5	0.5	0	3.2	0	1.3	1	0.7	1	0.9
Another person with malaria	3.7	6.9	2.7	1.5	5.4	1.6	11.3	4.8	2.1	1.8	6.1	2
Dirty surroundings	21.6	41.4	20.9	12.8	21.5	10.3	43.8	18	22.7	18	23.4	20.4
Standing water	18.0	29.1	18.7	17.3	12.4	11.4	35	21	16.8	11	23.9	13.8
Other:												
Being bitten by other insects/pests	0.2	0	0	1	0	0	0	0	0.7	0	0	0.4
Bad hygiene	0.1	0	0	0.5	0	0	0	0	0.3	0	0	0.2
Flies	0.1	0	0	0.5	0	0	0	0	0.3	0	0	0.2
Cow/spoilt milk/yogurt	0.1	0	0	0.5	0	0	0	0	0.3	0	0	0.2
Other	0.2	0	0	0.5	0	0.5	0	0	0.3	0.4	0	0.4
Don't Know	17.2	3	20.9	10.7	32.3	21.1	2.5	12	17.1	27	10.4	22

Table 11: Knowledge that mosquitoes are the only cause of malaria

Among respondents who have heard of malaria

	Site					Location				Urban/Rural		
	Total	Maputo	Beira	Queli- mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	952	203	182	196	186	185	80	314	286	272	394	558
Mosquitoes only	30.0	23.2	29.1	37.8	28.0	32.4	16.3	35.4	29.7	28.3	31.5	29.0
Mosquitoes and other causes	46.4	71.9	40.1	41.8	34.9	41.1	78.8	45.9	48.3	35.7	52.5	42.1
Other causes only	6.3	2.0	9.9	9.7	4.8	5.4	2.5	6.4	4.9	8.8	5.6	6.8
Don't Know	17.2	3.0	20.9	10.7	32.3	21.1	2.5	12.4	17.1	27.2	10.4	22.0

### 3.3 KNOWLEDGE OF VULNERABLE GROUPS

In order to measure knowledge of vulnerable groups—children under five and pregnant women—respondents who recognized the term malaria were shown a page with drawings of five household members: a man, a woman (not pregnant), a pregnant woman, a child of age 3, and a child of age 6. They were asked to select the person most vulnerable to a serious case of malaria and to then select, among the remaining, who else is most vulnerable.

- Just over half (58%) selected the corrected two drawings: that of the young child and the pregnant woman. Knowledge of vulnerable groups was similar among urban and rural areas, but there was some variation by site. Knowledge of vulnerable groups was highest in Tete (71%) and lowest in Beira (50%).
- Forty-two percent (42%) included in their selection a household member who was not among the most vulnerable: 28% selected the child of 6 years; 4% selected the non-pregnant woman; and 3% selected the man.

Table 12: Selection of vulnerable groups

Among respondents who have heard of malaria (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Queli-mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	952	203	182	196	186	185	80	314	286	272	394	558
Man	2.8	2.5	4.9	2.6	0.5	3.8	5	2.9	2.4	2.6	3.3	2.5
Woman	3.5	1	5.5	2	1.6	7.6	1.3	4.1	2.8	4	3.6	3.4
Pregnant woman	65.9	62.6	54.9	65.3	75.8	70.8	66.3	71.7	62.6	62.5	70.6	62.5
Child of 6 years	28.4	38.4	30.2	31.6	19.9	20.5	33.8	25.8	29	29	27.4	29
Child of 3 years	86.3	87.2	83.5	84.7	89.8	86.5	81.3	86.3	85.3	89	85.3	87.1

Table 13: Knowledge of vulnerable groups

Among respondents who have heard of malaria

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Queli-mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	952	203	182	196	186	185	80	314	286	272	394	558
Knows vulnerable group (pregnant woman and child under 5)	58.3	51.7	49.5	55.6	71	64.3	50	62	55.9	59	59.9	57.2
Does not know vulnerable group	41.7	48.3	50.5	44.4	29	35.7	50	38	44.1	42	40.1	42.8

### 3.4 EXPOSURE TO INFORMATION ON AVOIDING MALARIA

In order to obtain a general idea of the extent to which people are currently being given information about preventing malaria, respondents who had heard of malaria were asked whether they had received any information about preventing malaria in the past year. Those who had heard something were asked where they heard it.

- Over one-third (39%) of the respondents who had heard of malaria reported that they did not receive any information about avoiding malaria in the past twelve months.
- There was variation by site in the proportion of respondents (among those who had heard of malaria) who had received information in the past 12 months, ranging from 72% in Maputo to 42% in Nampula.
- Exposure to information on avoiding malaria was somewhat higher among urban (65%) than rural (59%) respondents and decreased with distance from the urban center.
- Of those respondents who had heard information about avoiding malaria, over half (59%) heard information from a radio. Radio was mentioned by a higher percentage of urban (71%) than rural (50%) households. Only 15% saw information on TV, but percentages were much higher in households in Maputo proper (43%) and were generally much higher in urban (27%) than rural (5%) households.

- Thirty-nine percent (39%) saw information about avoiding malaria on posters or notices at health facilities and 30% heard information through health staff working at those facilities. Twenty-nine percent (29%) heard information from friends, neighbors, or relatives. Three percent (3%) of urban and 6% of rural residents had heard information *only* from non-professionals (friends, neighbors, or relatives), rather than from more professional and presumably more reliable sources.

Table 14: Exposure to information on avoiding malaria  
Among respondents who have heard of malaria

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	952	203	182	196	186	185	80	314	286	272	394	558
Yes	61.1	72.4	60.4	71.4	57.5	42.2	76.3	62	64	53	64.7	58.6
No	38.9	27.6	39.6	28.6	42.5	57.8	23.8	38	36	47	35.3	41.4

Table 15: Exposure to information on avoiding malaria, by source  
Among respondents who have seen/heard information about malaria in the 12 months prior to the interview (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	582	147	110	140	107	78	61	194	183	144	255	327
Radio	58.8	51	50	59.3	64.5	76.9	62.3	73	50.8	48	70.6	49.5
Television	14.6	24.5	8.2	11.4	11.2	15.4	42.6	22	3.3	6.9	27.1	4.9
News paper/magazine	5	5.4	1.8	3.6	8.4	6.4	8.2	9.8	1.1	2.1	9.4	1.5
Staff at shop/pharmacy/market	3.1	8.2	0.9	1.4	0	3.8	6.6	1.5	2.2	4.9	2.7	3.4
Poster/notice at shop/pharmacy/market	8.1	16.3	6.4	10	0	2.6	26.2	7.2	6.6	3.5	11.8	5.2
Health staff/personnel	30.1	40.1	18.2	34.3	26.2	25.6	21.3	23	33.9	38	22.7	35.8
Poster/notice at health facility	39.2	49	31.8	37.9	42.1	29.5	52.5	34	43.2	36	38	40.1
Church/mosque	0.9	1.4	0.9	0.7	0	1.3	0	0.5	1.1	1.4	0.4	1.2
School	5.8	7.5	6.4	8.6	1.9	2.6	9.8	7.2	2.7	6.3	7.8	4.3
Drama Group	4.3	2	3.6	6.4	5.6	3.8	1.6	7.7	1.6	4.2	6.3	2.8
Friends/Neighbors/Relatives	28.7	47.6	32.7	25	19.6	6.4	50.8	23	30.1	25	29.8	27.8
Organizations	0.2	0	0	0.7	0	0	0	0	0	0.7	0	0.3
Don't Know	1.4	0	3.6	2.1	0.9	0	0	1.5	1.1	2.1	1.2	1.5

Table 16: Exposure to information from "non-professional" and "professional" sources  
Among respondents who have heard of malaria

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	582	147	110	140	107	78	61	194	183	144	155	327
"Non-professional" sources only	4.8	4.1	8.2	5.7	3.7	1.3	1.6	3.1	7.1	5.6	2.7	6.4
"Non-professional" and "professional" sources	23.9	43.5	24.5	19.3	15.9	5.1	49.2	20.1	23.0	19.4	27.1	21.4
"Professional" sources only	69.9	52.4	63.6	72.9	79.4	93.6	49.2	75.3	68.9	72.9	69.0	70.6
Don't know	1.4	0	3.6	2.1	.9	0	0	1.5	1.1	2.1	1.2	1.5

### 3.5 MOSQUITO BITING PATTERNS

- When asked what time(s) of the day mosquitoes bite them the most, the vast majority of respondents (86%) said at night when they are sleeping and 63% mentioned evening or night before sleeping.

Table 17: Time of day when mosquitoes bother or bite the most  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599
Morning	6.6	3.4	4	16	3	6.6	4.9	8.8	7.3	4	8	5.7
Afternoon	6.2	13.2	2	9	2	4.6	12.3	3.1	7	7	5	7
Evening or night before sleeping	62.6	70.1	49.7	62.5	60.3	70.1	65.4	65	62.3	59	65.3	60.8
At night when you are sleeping	86.2	94.1	85.4	82	88.9	80.2	92.6	85	85.3	87	86.5	86
All day long	3.9	4.9	3	4.5	0	7.1	6.2	3.4	5	2.7	4	3.8
Don't Know	1.1	0.5	1.5	0.5	1	2	0	1.6	0.7	1.3	1.3	1

## SECTION 4

### MOSQUITO NETS

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#### 4.1 PERCEIVED ADVANTAGES AND DISADVANTAGES OF NET USE BY VULNERABLE GROUPS

Children under five and pregnant women are the most vulnerable to getting a serious case of malaria, and a key measure of the success of NetMark will be whether it achieves gains in the proportions of these vulnerable groups regularly sleeping under a treated net. All respondents, whether net owners or not, were asked (unprompted) what advantages and disadvantages they saw in a child under five sleeping under a net, in a child under five sleeping under a *treated* net, and in a pregnant woman sleeping under a *treated* net. NetMark qualitative research showed that perceived advantages/disadvantages for children under five and for pregnant women differed; therefore each of those groups was asked about separately. Further, questions about advantages/disadvantages of “sleeping under a net” were separated from the questions about “sleeping under a treated net” since qualitative research showed that the perceived benefits of and barriers to sleeping under a net were different from those for sleeping under an insecticide-treated net. Responses were unprompted and multiple responses were accepted.

Since many people may not have heard of sleeping under a treated net, it was necessary to introduce the concept before asking for a reaction to it. Before being asked about perceptions of sleeping under a treated net, each respondent was told that a treated net was one that had been dipped or sprayed with insecticide. Then the questions about advantages and disadvantages were asked.

Given that perceptions may differ among those who are familiar with using nets and those who are not, in the tables that follow, the data for the “advantages and disadvantages” questions are further broken down by net owners and non-owners.

##### **Advantages of sleeping under a mosquito net for child under five**

- Almost all respondents (92%) named at least one advantage for a child under five sleeping under a mosquito net.
- The most commonly mentioned advantage of a child under five sleeping under a mosquito net was to “avoid getting bitten by mosquitoes” (74%). The second most frequently mentioned benefit was to “avoid getting malaria” (using either the word “malaria” or a local term for the illness) (59%). Another commonly mentioned advantage was to “sleep better” (28%).
- The idea that nets can help avoid getting malaria (whether the term was stated in Portuguese or a local language) was mentioned as an advantage by a higher percentage of respondents in the Maputo (69%) and Quelimane (72%) sites than in other sites.

Table 18: Perceived advantages of sleeping under a mosquito net for child under five  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural		Net Ownership	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	Net Owner	Non-Owner
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599	265	734
Avoid getting bitten by mosquitoes	73.5	85.3	74.9	57.5	71.4	78.2	90.1	78	71.3	67	80.3	68.9	77.7	71.9
Avoid getting "malaria"	56.5	65.7	47.7	70	43.2	55.3	67.9	60	61.3	45	61.8	52.9	66.8	52.7
Avoid getting [local term for malaria]	2.4	2.9	2.5	1.5	0	5.1	3.7	0.9	3	3	1.5	3	1.1	2.9
Don't get bothered by other insects/other pests	15.1	19.1	18.6	8	20.1	9.6	23.5	16	15	12	17.8	13.4	17.4	14.3
Sleep better	28.4	37.7	30.7	36.5	22.6	14.2	44.4	28	30	23	31.3	26.5	24.5	29.8
Warmer/gives warmth	0.2	1	0	0	0	0	1.2	0	0	0.3	0.3	0.2	0	0.3
Protects against dust/dirt	4	6.4	5	6	0.5	2	8.6	3.8	4.3	2.7	4.8	3.5	4.9	3.7
Gives privacy	4.6	6.9	2	3.5	1	9.6	7.4	6.3	3.3	3.3	6.5	3.3	6.4	4
Saves money/time because child not sick	4.3	10.8	3.5	0.5	5	1.5	14.8	3.8	3.3	3	6	3.2	4.9	4.1
Is an economical/lasting solution	3.2	10.3	3	1	1	0.5	13.6	1.9	3.3	1.7	4.3	2.5	2.3	3.5
Don't Know	8.3	7.8	8.5	4	8.5	12.7	2.5	4.4	7	15	4	11.2	4.5	9.7

### Disadvantages of sleeping under a mosquito net for child under five

- The majority of respondents (85%) did not cite any disadvantage ("none" or "don't know any") to a child under five sleeping under a mosquito net. Among those disadvantages that were mentioned, the most commonly mentioned were: "mosquitoes still make noise" (4%), "it is hot sleeping under a net" (4%), and "it take time to tuck in the net each night" (3%).
- No major differences were seen between urban and rural respondents and net owners and non-owners.

Table 19: Perceived disadvantages of sleeping under a mosquito net for child under five  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural		Net Ownership	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	Net Owner	Non-Owner
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599	265	734
It is hot sleeping under a net	3.5	2.5	0	11	0.5	3.6	4.9	6.3	1.7	2	6	1.8	4.9	3
Mosquitoes can still bite through the net	0.9	0	1	2.5	0	1	0	1.3	0.7	1	1	0.8	0	1.2
Mosquitoes can still get in the net	2.1	1.5	1.5	3	0	4.6	3.7	3.8	0.7	1.3	3.8	1	2.6	1.9
Mosquitoes still make noise	3.7	1.5	6	7	0	4.1	3.7	9.1	1	0.7	8	0.8	4.5	3.4
It is difficult/inconvenient if child has to get up in the night	1.6	2.5	2	2.5	0.5	0.5	3.7	2.2	1.3	0.7	2.5	1	0.4	2
It takes time to tuck in the net each night	2.8	2	1.5	9	0.5	1	3.7	4.4	1.7	2	4.3	1.8	1.9	3.1
There is not enough air under the net	0.4	1	1	0	0	0	1.2	0	0.7	0.3	0.3	0.5	1.1	0.1
Child might suffocate	2.3	2.9	2.5	3.5	0.5	2	3.7	2.8	3.3	0.3	3	1.8	2.3	2.3
Child may tear net	1.9	2.5	4.5	1	0.5	1	4.9	3.1	0.7	1	3.5	0.8	1.9	1.9
Child might get caught/trapped	1.8	3.4	2	3	0	0.5	4.9	2.2	1.7	0.7	2.8	1.2	1.5	1.9
Child will get used to net and won't be able to sleep w/o it	1.7	0.5	2	1.5	0.5	4.1	1.2	3.4	0.7	1	3	0.8	2.6	1.4
Too expensive/can't afford net	2	2.9	0	5	0	2	7.4	1.6	1.7	1.3	2.8	1.5	0.8	2.5
Other:														
Kids are not comfortable/ scared/lonely	0.1	0	0	0	0	0.5	0	0	0.3	0	0	0.2	0.4	0
None	42.7	52	46.7	36	56.8	21.8	49.4	44.2	42.3	39.8	45.3	41.1	48.7	40.6
Don't Know	42.3	33.3	42.2	30	41.2	65.5	25.9	35.7	45	51.2	33.8	48.1	35.8	44.7

## Advantages of sleeping under a *treated* net for child under five

- Most respondents (82%) named at least one advantage for a child under five sleeping under a *treated* net.
- The most commonly cited advantages of a child sleeping under a treated net had to do with its greater efficacy than an untreated one: “kills mosquitoes” (48%); “works better against mosquitoes than an untreated net” (33%); “better at preventing malaria” (local and Portuguese terms) (29%); “repels mosquitoes away from the net” (27%); and “child is more protected” (20%).
- A higher percentage from urban areas (40%) reported that a treated net “works better against mosquitoes than an untreated net” than rural areas (29%). Knowledge about a treated net working better against mosquitoes than an untreated net decreased with distance from urban centers.
- A higher percentage of respondents in urban Maputo named the advantages of a treated net (e.g. “works better against mosquitoes than an untreated net”, “better at preventing malaria”, “repels mosquitoes away from net”, and “child is more protected”) than respondents elsewhere.
- A higher percentage of net owners (33%) reported that a treated net “repels mosquitoes away from net” than non-net owners (24%).

Table 20: Perceived advantages of sleeping under a treated mosquito net for child under five  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural		Net Ownership	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	Net Owner	Non-Owner
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599	265	734
Works better against mosquitoes than an untreated net	33.4	45.1	28.1	18.5	30.2	45.2	50.6	38	32	26	40.3	28.9	38.5	31.6
Kills mosquitoes	48.3	53.9	41.2	53.5	30.2	62.9	55.6	49	50.3	44	50	47.2	49.4	48
Repels mosquitoes away from net	26.5	36.3	24.1	27.5	29.6	14.7	40.7	25	28.3	22	28.5	25.2	32.8	24.3
Kills/repels other insects or pests	13.2	18.1	14.6	14	14.1	5.1	17.3	14	11.7	13	14.5	12.4	13.6	13.1
Is better at preventing “malaria”	27.2	37.7	30.2	36	23.6	8.1	39.5	25	27.7	25	28.3	26.5	27.9	27
Is better at preventing [local term for malaria]	1.4	2	0.5	0.5	0.5	3.6	0	0.6	1.7	2.3	0.5	2	1.5	1.4
Child is more protected	20.2	23.5	21.6	16.5	24.6	14.7	27.2	20	19	19	21.8	19.2	17	21.4
Save more money/time because child is not sick	1.4	2.9	0	0.5	1	2.5	1.2	1.6	1.3	1.3	1.5	1.3	2.6	1
None	1.8	2.9	2.5	0.5	2	1	3.7	1.9	2.3	0.7	2.3	1.5	3.8	1.1
Don't Know	16.2	14.2	20.6	13.5	18.1	14.7	7.4	13	15.3	23	12	19	11.3	18

## Disadvantages of sleeping under a *treated* net for child under five

- Most respondents (82%) did not cite any disadvantage (“none” or “don’t know any”) for child under five sleeping under a *treated* net.
- The most commonly mentioned disadvantages had to do with concerns about the smell and safety of the chemical: “smell is bad” (7%); “chemical is dangerous” (5%); “causes irritation/cough” (5%); “chemical can kill child” (4%); and “child might chew/suck net” (4%).

Table 21: Perceived disadvantages of sleeping under a treated mosquito net for child under five  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural		Net Ownership	
		Maputo	Beira	Queli- mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	Net Owner	Non- Owner
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599	265	734
Insecticide is not effective	1	0	2	1	0.5	1.5	0	2.5	0.7	0	2	0.3	1.1	1
Smell is bad	7.2	10.3	8	10	1	6.6	12.3	8.8	7.7	3.7	9.5	5.7	10.6	6
Causes irritation/cough	4.5	8.3	6	3	2.5	2.5	13.6	5.6	2	3.3	7.3	2.7	6	4
Causes other illness	2.1	2.5	2	2.5	1	2.5	3.7	3.8	1	1	3.8	1	3.8	1.5
Child might chew/suck net	4.1	4.9	8.5	3	2.5	1.5	11.1	6.6	2	1.7	7.5	1.8	6.4	3.3
Chemical is dangerous	5	4.4	5.5	4	4.5	6.6	6.2	6.9	3.7	4	6.8	3.8	6.4	4.5
Chemical can kill child	3.8	2.9	7	3	2.5	3.6	3.7	5.6	3	2.7	5.3	2.8	6	3
Treated net can't be washed	1.3	1	2	3	0	0.5	1.2	2.8	0.3	0.7	2.5	0.5	1.1	1.4
Treated net gets dirty	0.5	0.5	0	1.5	0	0.5	1.2	0.9	0.3	0	1	0.2	0.8	0.4
Causes Cancer	0.1	0	0	0.5	0	0	0	0	0.3	0	0	0.2	0	0.1
Other	0.1	0	0	0	0	0.5	0	0	0.3	0	0	0.2	0	0.1
None	33.6	40.2	36.7	31	46.7	13.2	37	33	34.3	33	33.5	33.7	35.1	33.1
Don't Know	48.1	39.7	43.2	45	43.7	69.5	33.3	42	51.3	56	40.3	53.4	41.1	50.7

### Advantages of sleeping under a *treated* net for pregnant woman

- The vast majority of respondents (83%) named at least one advantage for a pregnant woman sleeping under a *treated* net.
- The most commonly mentioned advantages for a pregnant woman sleeping under a treated net were that it “kills mosquitoes” (44%), that it “works better against mosquitoes than a net that has not been treated” (33%), that the “pregnant woman is more protected” (30%), and that it is better at preventing malaria (local and Portuguese term) (30%). A higher percentage of respondents in Maputo urban cited that treated nets are advantageous because they “kill mosquitoes” (59%) and “repel mosquitoes away from the net” (42%) than respondents elsewhere.
- Overall, perceived advantages were fairly evenly distributed among net owners and non-owners.

Table 22: Perceived advantages of sleeping under a treated mosquito net for pregnant woman  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural		Net Ownership	
		Maputo	Beira	Queli- mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	Net Owner	Non- Owner
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599	265	734
Works better against mosquitoes than untreated net	33	40.2	27.1	20	27.1	50.8	40.7	38	34.3	24	38.5	29.4	35.5	32.2
Kills mosquitoes	44.3	50	35.7	49	28.1	58.9	59.3	46	44	40	48.3	41.7	47.2	43.3
Repels mosquitoes away from net	23.6	37.7	24.1	18	25.1	12.7	42	24	23	19	27.3	21.2	28.7	21.8
Kills/repels other insects or pests	12.3	19.1	12.1	12	14.6	3.6	17.3	11	14.3	10	12.5	12.2	12.1	12.4
Is better at preventing “malaria”	28.3	40.7	24.6	39.5	25.6	10.7	37	26	29	28	28	28.5	35.1	25.9
Is better at preventing [local name for malaria]	2	1.5	1	0.5	0	7.1	2.5	0	2	4	0.5	3	1.5	2.2
Is better at preventing miscarriage/stillbirth	3.3	7.4	2.5	4.5	0	2	4.9	2.2	2.7	4.7	2.8	3.7	2.6	3.5
Pregnant woman is more protected	29.9	33.3	38.2	24	39.7	14.2	37	35	28.7	24	35.3	26.4	30.9	29.6
Save more money/time because pregnant woman is not sick	1.9	5.9	2	0.5	0	1	9.9	0.6	3	0	2.5	1.5	2.6	1.6
Prevents other illness	0.1	0	0	0.5	0	0	0	0	0.3	0	0	0.2	0.4	0
None	1.1	1.5	2	0.5	1	0.5	1.2	0.9	1.7	0.7	1	1.2	1.9	0.8
Don't Know	16	14.2	22.1	12	16.1	15.7	8.6	13	15.7	22	12	18.7	9.8	18.3

## Disadvantages of sleeping under a *treated* net for pregnant woman

- Most respondents (78%) did not cite any disadvantages (“none” or “don’t know any”) of a pregnant woman sleeping under a *treated* mosquito net.
- Among those disadvantages that were mentioned, the most commonly mentioned had to do with concerns about the safety and smell of the chemical: “might make woman nauseated/vomit” (9%), “chemical is dangerous” (7%), “smell is bad” (7%), “causes irritation/cough” (6%), and “chemical can kill fetus/ cause miscarriage” (5%).

Table 23: Perceived disadvantages of sleeping under a treated mosquito net for pregnant woman  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural		Net Ownership	
		Maputo	Beira	Queli- mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	Net Owner	Non- Owner
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599	265	734
Insecticide is not effective	0.2	0	1	0	0	0	0	0.6	0	0	0.5	0	0	0.3
Smell is bad	7.3	11.3	5	11.5	1.5	7.1	14.8	8.5	6	5.4	9.8	5.7	8.7	6.8
Causes irritation/cough	6.1	10.8	3	7.5	3	6.1	13.6	6.3	5.7	4.3	7.8	5	6.4	6
Causes other illness	2.2	3.9	2.5	2.5	1	1	6.2	2.5	1.3	1.7	3.3	1.5	2.6	2
Might make woman nauseated/ vomit	8.8	11.8	11.6	9	4	7.6	21	12	7.3	3.3	14	5.3	10.2	8.3
Chemical is dangerous	6.6	2	7.5	5.5	6.5	11.7	2.5	12	5	3.7	10	4.3	8.3	6
Chemical can kill fetus/cause miscarriage	5.1	4.4	7	4	6	4.1	4.9	6.3	5	4	6	4.5	6.4	4.6
Treated net can't be washed	1.3	1	1	3.5	0	1	1.2	2.5	0.7	0.7	2.3	0.7	1.5	1.2
Treated net gets dirty	0.7	0.5	0	2	0	1	0	1.6	0.3	0.3	1.3	0.3	0.8	0.7
Causes Cancer	0.1	0	0	0.5	0	0	0	0	0.3	0	0	0.2	0	0.1
Other	0.1	0	0	0	0	0.5	0	0	0.3	0	0	0.2	0	0.1
None	31.8	34.8	36.7	28.5	46.7	12.2	30.9	31	32.7	32	31	32.4	37	30
Don't Know	46.1	39.2	45.2	43	41.2	62.4	30.9	40	47.3	56	38	51.6	38.9	48.8

## 4.2 ACCESS TO MOSQUITO NETS

Improving access to nets is a primary objective of the NetMark partnership, as access is a pre-requisite for ownership. All respondents, whether a net owner or not, were asked where the nearest place was where they could purchase a net. They were also asked what mode of transport they would take to get there, and how long it would take to get there.

- The nearest places respondents reported they could buy mosquito nets were open air/structured markets (39%) and general shops (16%).
- Overall 28% of respondents reported that mosquito nets are not available or they did not know where to get them, with a higher percentage of rural (35%) than urban respondents (13%) reporting so. Percentages of respondents reporting non-availability of nets or not knowing where to get them were particularly high in far rural areas (43%). Percentages also varied greatly by site, and were lowest in sites with net-promotion projects — Maputo (21%) and Quelimane (15%).
- The majority of respondents (65%) reported that they would walk to get to the nearest place where they can purchase a mosquito net. The average amount of time to get there by foot was 31 minutes, although the amount of time needed varied considerably (standard deviation 35 minutes). Twenty-six percent (26%) said they would go by bus and that it would take well over an hour (74 minutes) (standard deviation 75 minutes). A higher percentage of urban (76%) households than rural households (56%) would walk, whereas a higher percentage of rural (33%) than urban (18%) households would go by bus.

Table 24: Nearest place households can purchase mosquito nets  
Among all households

	Site						Location				Urban/Rural	
	Total	Maputo	Beira	Queli- mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599
Not available	18.8	5.4	21.1	10.5	32.2	25.4	3.7	8.8	19.3	33.1	7.8	26.2
Open air/structured market	38.7	21.6	33.7	47	35.7	56.3	25.9	53.6	35	30.1	48	32.6
Local kiosk	0.3	0.5	0	1	0	0	0	0.3	0	0.7	0.3	0.3
Street/table top vendor	4.1	4.9	4	5.5	5	1	6.2	4.7	5	2	5	3.5
General shop	16.4	23.5	15.6	17	15.1	10.7	29.6	17.2	13.7	14.7	19.8	14.2
Textile/clothes shop/bedding shop	6.4	12.7	10.1	4.5	2.5	2	12.3	6	6	5.7	7.3	5.8
Wholesaler	1.6	0.5	1.5	4	1	1	1.2	2.2	2.3	0.3	2	1.3
Pharmacy/chemist	0.4	1	0	1	0	0	1.2	0	1	0	0.3	0.5
Drug store	0.2	0	0	1	0	0	0	0.6	0	0	0.5	0
Supermarket	0.8	2	1.5	0	0.5	0	2.5	0.9	0.3	0.7	1.3	0.5
Mini-mart	0.6	0.5	1	1.5	0	0	1.2	0.9	0.3	0.3	1	0.3
Project (e.g. NGO)	0.1	0.5	0	0	0	0	1.2	0	0	0	0.3	0
Clinic/hospital	2.7	10.3	1.5	1.5	0	0	3.7	0	7	1	0.8	4
Bought abroad	0.1	0.5	0	0	0	0	0	0	0	0.3	0	0.2
Don't Know	8.7	16.2	10.1	5.5	8	3.6	11.1	4.7	10	11	6	10.5

Table 25: Mode of transport to get to nearest place where net purchase can be made  
Among households that know of the nearest place where they can purchase a mosquito net

	Site						Location				Urban/Rural	
	Total	Maputo	Beira	Queli- mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	724	160	137	168	119	140	69	276	212	167	345	379
By foot/walk	65.3	57.5	43.1	76.2	74.8	75	63.8	78.6	50.5	62.9	75.7	55.9
By bus	26.1	32.5	46	13.7	20.2	19.3	30.4	15.2	39.6	25.1	18.3	33.2
By car	7.2	9.4	10.2	7.7	3.4	4.3	5.8	5.1	7.5	10.8	5.2	9
Don't know	1.4	0.6	0.7	2.4	1.7	1.4	0	1.1	2.4	1.2	0.9	1.8

Table 26: Length of time it takes by foot to get to nearest place where net could be purchased  
Among respondents who travel by foot to get to nearest place

	Site						Location				Urban/Rural	
	Total	Maputo	Beira	Queli- mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	473	92	59	128	89	105	44	217	107	105	261	212
Mean no. of minutes	31.0	15.43	34.02	31.34	46.22	29.64	18.48	28.9	28.67	42.95	27.13	35.75
Standard Deviation	35.17	12.04	43.32	30.68	53.81	20.45	15	21.42	32.49	57.08	20.82	46.77
Median value	19.75	9.91	14.85	19.96	28.59	24.25	11.5	24.67	14.31	17.21	22.95	16
Don't Know (%)	0.2	0	0	0.8	0	0	0	0.5	0	0	0.4	0

Table 27: Length of time it takes by bus to get to nearest place where net could be purchased  
Among respondents who travel by bus to get to nearest place

	Site						Location				Urban/Rural	
	Total	Maputo	Beira	Queli- mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	189	52	63	23	24	27	21	42	84	42	63	126
Mean no. of minutes	73.5	68.31	65.87	63.04	89.29	96.19	29.29	32.02	65.63	152.83	31.11	94.7
Standard Deviation	75.13	55.67	85.34	70.12	64.6	91.99	17.88	15.84	59.26	95.03	16.45	83.65
Median value	44.19	46.5	40.5	33.5	80	37.5	18.63	28.2	47.5	119.38	27.83	65

### 4.3 AFFORDABILITY OF MOSQUITO NETS

One of the objectives of NetMark is to make ITMs more affordable. Affordability is being monitored in several ways, mostly via other NetMark-sponsored studies. “Willingness to pay” information was gathered as part of market research conducted by Research International; and data on price of nets is being monitored using periodic retail audits and manufacturers’ sales data.

This household survey contains two supplementary measures of affordability. On the assumption that actual price paid is a good indicator of affordability, respondents were asked how much they paid for each net owned. Data on price of nets is found in “Characteristics of Nets Owned” (Section 4.5). Respondents from households without nets were asked why they did not own any nets. “Cost/can’t afford” is one response category, serving as a measure of the extent to which respondents perceive nets to be too expensive. Data on this question are found at the end of the following section on “Mosquito net ownership.”

### 4.4 MOSQUITO NET OWNERSHIP

One of the main topics of interest is net ownership or “coverage”—both the extent of coverage and pattern of coverage in terms of characteristics such as socio-economic status and location. Respondents were asked if their household owned any mosquito nets, and, if so, how many. “Net” refers to any type or shape of net except baby nets (small umbrella-type nets that only fit an infant). Respondents from households without nets were asked why they did not own a net.

#### Ownership patterns

- Twenty-seven percent (27%) of households reported owning one or more mosquito nets. This figure may be higher than the national average, given that two of the sample sites — Maputo and Quelimane — have active net promotion projects.
- Ownership was higher among urban (34%) than rural (22%) households.
- There was variation by site in the proportion of households that owned mosquito nets, ranging from 16% in Beira to 36% in Maputo.
- Thirty-eight percent (38%) of net-owning households owned more than one net: 25% owned two nets and 11% owned three. The mean number of nets owned among all net-owning households was 1.6.
- There is a direct positive linear relationship between net ownership and SES: the higher the SES, the more likely a household is to own a net.

Table 28: Household ownership of mosquito nets  
Among all households

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Maputo	Beira	Queli- mane	Tete	Nam- pula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599	199	200	200	201	199
Yes	26.5	36.3	16.1	31	22.6	26.4	24.7	36	22.3	21	34	21.5	4.5	15.5	26	38.8	47.7
No	73.5	63.7	83.9	69	77.4	73.6	75.3	64	77.7	79	66	78.5	95.5	84.5	74	61.2	52.3

Table 29: Number of mosquito nets owned  
Among households owning mosquito nets

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>BASE</b>	265	74	32	62	45	52	20	116	67	62	136	129	9	31	52	78	95
1	62.3	59.5	50	59.7	73.3	67.3	65	62.1	64.2	59.7	62.5	62	77.8	71	71.2	65.4	50.5
2	25.3	29.7	25	30.6	13.3	23.1	30	21.6	25.4	30.6	22.8	27.9	22.2	22.6	23.1	23.1	29.5
3	10.6	8.1	21.9	8.1	11.1	9.6	5	15.5	7.5	6.5	14	7	0	3.2	3.8	11.5	16.8
4	0.8	0	0	1.6	2.2	0	0	0.9	0	1.6	0.7	0.8	0	0	1.9	0	1.1
5+	1.1	2.7	3.1	0	0	0	0	0	3	1.6	0	2.3	0	3.2	0	0	2.1
Mean no. of nets	1.57	1.68	1.84	1.52	1.42	1.42	1.4	1.55	1.55	1.66	1.53	1.6	1.22	1.65	1.37	1.46	1.77
Standard Deviation	1.04	1.47	1.11	0.72	0.78	0.67	0.6	0.78	1	1.5	0.76	1.27	0.44	1.99	0.66	0.7	1

## Reasons for non-ownership

- The vast majority of non-net owning households (84%) reported that a reason why they don't own any mosquito nets is because they "don't have any/enough money." A somewhat higher proportion of rural (85%) than urban (79%) respondents cited this reason. There is a direct linear relationship between SES and respondents' perception that they "don't have any/enough money": the higher the SES, the less likely the respondent was to state this reason for non-ownership. At the same time, nearly two-thirds (64%) of respondents in the highest SES category cited "don't have any/enough money" as a reason for non-ownership.
- Overall, nine percent (9%) said that nets are not available or they don't know where to get them, but an especially high proportion of Maputo area respondents (22%) cited this as a reason for not having a net.

Table 30: Reasons why households do not own any mosquito nets  
Among households that do not own mosquito nets (multiple responses possible)

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>BASE</b>	734	130	167	138	154	145	61	203	233	237	264	470	190	169	148	123	104
Don't have any/enough money	84.1	70	79	87.7	90.3	92.4	75.4	80	85.4	88	79.2	86.8	94.2	89.9	85.1	76.4	63.5
Not available/don't know where to get them	8.6	21.5	12	5.1	2.6	2.8	11.5	3.9	10.3	10	5.7	10.2	5.8	10.1	10.1	8.9	8.7
Don't like them	3.1	0	9	3.6	0	2.1	0	11	0	0.4	8.3	0.2	1.1	0	1.4	2.4	15.4
Don't need them	3.1	8.5	4.2	2.2	0.6	0.7	13.1	4.9	1.3	0.8	6.8	1.1	0.5	0	1.4	4.1	14.4
Nets won't fit on sleeping space	1.9	0	5.4	1.4	0.6	1.4	0	5.4	0	1.3	4.2	0.6	1.1	0.6	2	3.3	3.8
Don't Know	2.3	5.4	3	1.4	1.3	0.7	8.2	2	1.7	1.7	3.4	1.7	0	0.6	2	4.9	6.7

## 4.5 CHARACTERISTICS OF NETS OWNED

Respondents in net-owning households were asked, for each net owned, where the net was obtained, when the net was acquired, and what brand, size, and shape and price it was. They were also asked how often, if at all, the net was washed, since effectiveness of the treatment diminishes with washing, and frequency of washing will affect decisions about insecticide treatment formulations and decisions about educational messages.

### Where nets were obtained

- Net-owning households obtained their nets from a variety of sources, most of them commercial. Forty-four percent (44%) of nets were purchased in a market, 12% from a street vendor, 12% from a general shop, 6% from a textile shop, 5% from a project, 4% as a gift, and 3% from a clinic.
- A higher percentage of nets in urban households were obtained from a market, street vendor, or general shop than nets in rural households, whereas a higher percentage of nets in rural households were obtained from a project, clinic, or as a gift than nets in urban households. The percentage of nets obtained from open-air markets ranged from 12% in Maputo to 73% in Nampula.
- Seventeen percent (17%) of nets owned by households in or around Maputo were obtained from a project.

Table 31: Place where net was obtained  
Among total number of nets owned

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	403	114	57	94	64	74	28	180	100	95	208	195
Market	44.4	12.3	45.6	58.5	46.9	73	14.3	58.9	41	29.5	52.9	35.4
Kiosk	1	1.8	0	0	3.1	0	0	1.1	0	2.1	1	1
Street vendor	12.2	13.2	15.8	14.9	15.6	1.4	14.3	13.3	14	7.4	13.5	10.8
General shop	11.9	10.5	12.3	10.6	15.6	12.2	21.4	13.9	6	11.6	14.9	8.7
Textile shop	5.7	9.6	5.3	3.2	4.7	4.1	7.1	2.2	8	9.5	2.9	8.7
Wholesaler	2.2	0.9	5.3	2.1	0	4.1	3.6	3.3	0	2.1	3.4	1
Pharmacy	0.2	0.9	0	0	0	0	0	0	1	0	0	0.5
Drug store	0	0	0	0	0	0	0	0	0	0	0	0
Supermarket	0.7	0.9	0	0	3.1	0	3.6	0.6	0	1.1	1	0.5
Mini-mart	0.5	0	0	1.1	1.6	0	0	0	1	1.1	0	1
Project	5	16.7	0	1.1	0	0	3.6	0.6	0	18.9	1	9.2
Clinic	3	7.9	5.3	0	0	0	0	0	12	0	0	6.2
School	0	0	0	0	0	0	0	0	0	0	0	0
Gift	4	9.6	1.8	2.1	1.6	1.4	7.1	1.1	7	5.3	1.9	6.2
Employer	0.5	0	0	1.1	1.6	0	0	1.1	0	0	1	0
Bought abroad	0.2	0	0	0	1.6	0	0	0.6	0	0	0.5	0
Don't Know	8.4	15.8	8.8	5.3	4.7	4.1	25	3.3	10	11.6	6.3	10.8

Table 32: Type of source where net was obtained  
Among total number of nets owned

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>BASE</b>	403	114	57	94	64	74	28	180	100	95	208	195	11	43	71	114	164
Informal commercial source	57.6	27.2	61.4	73.4	65.6	74.3	28.6	73.3	55	38.9	67.3	47.2	54.5	44.2	57.7	54.4	63.4
Formal commercial source	21.3	22.8	22.8	17	25	20.3	35.7	20	16	25.3	22.1	20.5	18.2	18.6	14.1	28.9	20.1
Non-commercial source	8.4	24.6	5.3	2.1	1.6	0	3.6	1.7	12	18.9	1.9	15.4	9.1	30.2	15.5	3.5	3
Gift	4	9.6	1.8	2.1	1.6	1.4	7.1	1.1	7	5.3	1.9	6.2	9.1	2.3	1.4	4.4	4.9
Other	0.2	0	0	0	1.6	0	0	0.6	0	0	0.5	0	0	0	0	0	0.6
Don't Know	8.4	15.8	8.8	5.3	4.7	4.1	25	3.3	10	11.6	6.3	10.8	9.1	4.7	11.3	8.8	7.9

## Age of nets owned

- Sixty-five percent (65%) of nets owned by households were acquired within the past 2 years.
- The proportion of nets acquired in the past two years was approximately the same in the urban and rural areas.

Table 33: Number of years households have owned their nets  
Among total number of nets owned

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	403	114	57	94	64	74	28	180	100	95	208	195
0 <-1 year	38.7	39.5	22.8	54.3	26.6	40.5	25	36	38	48	34.6	43.1
1-<2 years	26.8	26.3	42.1	14.9	31.3	27	39.3	28	22	26	29.3	24.1
2-<3 years	17.9	14	8.8	19.1	26.6	21.6	17.9	19	15	19	18.8	16.9
3-<4 years	7.4	10.5	3.5	7.4	4.7	8.1	17.9	6.7	9	4.2	8.2	6.7
4-<5 years	1.2	1.8	0	1.1	1.6	1.4	0	1.7	2	0	1.4	1
5+ years	3.7	4.4	7	0	7.8	1.4	0	4.4	7	0	3.8	3.6
Don't know	4.2	3.5	15.8	3.2	1.6	0	0	4.4	7	2.1	3.8	4.6

## Brand of nets owned

- Households did not know the net brand for the vast majority (93%) of nets owned. Four percent (4%) of nets were PowerNet and only 2% were tailor-made (non-manufactured) nets.

Table 34: Net brands owned  
Among total number of nets owned

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	403	114	57	94	64	74	28	180	100	95	208	195
PowerNet	3.7	0	1.8	12.8	3.1	0	0	5	1	5.3	4.3	3.1
RAID	1.2	0	5.3	2.1	0	0	0	2.2	1	0	1.9	0.5
Tailor-made (non-manufactured)	1.7	0	5.3	4.3	0	0	0	2.2	1	2.1	1.9	1.5
Don't Know	93.3	100	87.7	80.9	96.9	100	100	90.6	97	92.6	91.8	94.9

## Size and shape of nets owned

- The most common net sizes owned were double (53%) and king (23%) nets. Sixteen percent (16%) of the nets were single-size and 3% cot-size nets. King-size and cot-size nets were more common in the urban than in the rural areas, whereas single-size nets were more common in the rural (23%) than in the urban areas (10%).
- The majority of nets were round/conical (59%) nets. Thirty-five percent (35%) of the nets were rectangular. Round/conical nets were more common in urban (74%) than in rural (44%) areas whereas rectangular nets were more common in rural (49%) than urban (21%) areas.

Table 35: Size of nets owned  
Among total number of nets owned

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	403	114	57	94	64	74	28	180	100	95	208	195
Cot net	2.5	2.6	3.5	2.1	0	4.1	10.7	3.3	0	1.1	4.3	0.5
Single	15.9	27.2	17.5	14.9	10.9	2.7	10.7	9.4	15	30.5	9.6	22.6
Double	52.9	56.1	38.6	60.6	64.1	39.2	57.1	51.1	58	49.5	51.9	53.8
King	22.6	5.3	38.6	13.8	25	45.9	14.3	31.7	19	11.6	29.3	15.4
Don't Know	6.2	8.8	1.8	8.5	0	8.1	7.1	4.4	8	7.4	4.8	7.7

Table 36: Shape of nets owned  
Among total number of nets owned

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Queli- mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	403	114	57	94	64	74	28	180	100	95	208	195
Rectangular	34.5	46.5	31.6	45.7	12.5	23	14.3	22	46	53	20.7	49.2
Round/conical	59.1	45.6	59.6	43.6	85.9	75.7	60.7	76	47	40	73.6	43.6
Triangle/pyramid	4.0	6.1	5.3	4.3	1.6	1.4	21.4	2.8	4	1.1	5.3	2.6
Wedge	1.5	1.8	1.8	3.2	0	0	3.6	0	2	3.2	0.5	2.6
Don't know	1.0	0	1.8	3.2	0	0	0	0	1	3.2	0	2.1

## Cost of nets owned

- Respondents were asked what the cost of each net owned was. The figures obtained give a general idea of price, but it should be noted that because of potential problems with recall for older nets, and because of currency devaluations over time, these figures should be taken as very general estimates.
- Households reported paying an average of 180324 (11 USD) per net (conversion based on the exchange rate for the dollar on the date of the data collection). Respondents did not know the cost for 17% of their nets.
- There was no discernable pattern between net cost and household SES level.

Table 37: Average cost of (all) nets (Meticals)  
Among total number of nets owned

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Maputo	Beira	Queli- mane	Tete	Nam- pula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>BASE</b>	403	114	57	94	64	74	28	180	100	95	208	195	11	43	71	114	164
Average price	180324	195738	158646	167434	160115	211862	197059	159863	195789	214849	163497	203935	65556	201875	165140	192919	181810
Standard Deviation	181935	160291	167258	203623	127147	215454	152593	160838	204665	212125	160010	207247	51017	223897	165046	190154	178831
Trade/Barter (%)	0.2	0	0	0	0	1.4	0	0	0	1.1	0	0.5	0	0	1.4	0	0
Free (%)	8.4	26.3	0	1.1	3.1	1.4	3.6	1.7	7	24.2	1.9	15.4	9.1	27.9	12.7	6.1	3
Don't Know (%)	17.4	20.2	15.8	18.1	21.9	9.5	35.7	11.1	22	18.9	14.4	20.5	9.1	16.3	15.5	18.4	18.3

Table 38: Average cost of (all) nets (USD)  
Among total number of nets owned

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Maputo	Beira	Queli- mane	Tete	Nam- pula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>BASE</b>	403	114	57	94	64	74	28	180	100	95	208	195	11	43	71	114	164
Average price	11	11.94	9.68	10.21	9.77	12.92	12.02	9.75	11.94	13.11	9.97	12.44	4	12.3	10.1	11.8	11.1
Standard Deviation	11.1	9.78	10.2	12.42	7.76	13.14	9.31	9.81	12.48	12.94	9.76	12.64	3.1	13.7	10.1	11.6	10.9
Trade/Barter (%)	0.2	0	0	0	0	1.4	0	0	0	1.1	0	0.5	0	0	1.4	0	0
Free (%)	8.4	26.3	0	1.1	3.1	1.4	3.6	1.7	7	24.2	1.9	15.4	9.1	27.9	12.7	6.1	3
Don't Know (%)	17.4	20.2	15.8	18.1	21.9	9.5	35.7	11.1	22	18.9	14.4	20.5	9.1	16.3	15.5	18.4	18.3

## Net washing patterns

- The majority of nets had been washed at least once. Of the nets that were ever washed (69%), most (68%) were reportedly washed once a month or less, with almost one-third (30%) of nets being washed weekly. Nets were reportedly washed less frequently in Maputo proper than elsewhere.

Table 39: Net ever washed

Among total number of nets owned

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	403	114	57	94	64	74	28	180	100	95	208	195
Yes	69.0	50	80.7	72.3	87.5	68.9	50	72.8	76	60	69.7	68.2
No	28.5	46.5	14	25.5	10.9	31.1	42.9	26.1	18	40	28.4	28.7
Don't know	2.5	3.5	5.3	2.1	1.6	0	7.1	1.1	6	0	1.9	3.1

Table 40: Net washing frequency

Among nets that had been washed

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	278	57	46	68	56	51	14	131	76	57	145	133
About once a year	8.6	19.3	6.5	10.3	5.4	0	21.4	8.4	13.2	0	9.7	7.5
About every six months	10.8	19.3	0	5.9	7.1	21.6	14.3	7.6	7.9	21	8.3	13.5
About every three months	10.8	8.8	17.4	7.4	10.7	11.8	28.6	11	9.2	8.8	12.4	9
About once a month	23.0	26.3	10.9	25	37.5	11.8	14.3	21	25	28	20	26.3
About every two weeks	15.1	17.5	21.7	22.1	8.9	3.9	7.1	15	22.4	7	14.5	15.8
About once a week	29.5	7.0	39.1	26.5	30.4	49.0	7.1	36	18.4	35	33.1	25.6
Not Answered	0.4	0	0	0	0	2	0	0.8	0	0	0.7	0
Don't Know	1.8	1.8	4.3	2.9	0	0	7.1	0.8	3.9	0	1.4	2.3

## 4.6 MOSQUITO NET TREATMENT

Nets that are treated with an insecticide are much more effective against mosquito bites (and therefore malaria) than untreated nets. The insecticide kills and repels mosquitoes and other insects, even if the net is torn or is not completely tucked in. An ITN also affords some protection for others sleeping in the same room, even if they are not sleeping under the net. Nets that are “pretreated” (i.e., already have insecticide on them when purchased) are beginning to be available in some areas, but even these nets need to be treated/re-treated (“post-treated”) regularly to remain effective.

In one section of the survey, all respondents were asked if they had heard of treating nets with an insecticide. In a later section, respondents living in net-owning households were asked whether their nets had ever been treated. For each net treated, respondents were asked how many months it has been since the last treatment, total number of post-treatments, product used to treat the nets, place where it was obtained, and how much it cost. Note that some calculations use the household as the unit of analysis (denominator), and others use nets as the unit of analysis.

- Twenty-eight percent (28%) of respondents had heard of treating mosquito nets with an insecticide. There was great variation by site in the proportion of respondents who had heard of treating mosquito nets, ranging from 18% in Beira to 51% in Quelimane. Awareness of ITNs was higher in urban (34%) than rural (25%) areas, and decreased with distance from urban centers. There is a strong positive linear relationship between awareness of net treatment and SES: the higher the SES, the more likely a respondent was to have heard of treating nets with insecticide. Seven percent (7%) of households owned a treated mosquito net. Ownership of treated mosquito nets increased with increasing SES status.
- Twenty-six percent (26%) of all nets had ever been treated: 18% had been pretreated with insecticide before purchase/acquisition and 19% were treated after purchase/acquisition. The percentage of pretreated nets differed among sites and was highest in Quelimane (27%) and Tete (25%) and lowest in Nampula (3%) and Maputo (4%).
- The percentage of nets that were treated after they were acquired was highest in Tete (34%) site and lowest in Nampula site (11%) as well as in Maputo itself (11%). There appeared to be little difference in the percentage of post-treated nets in rural (18%) and in urban (20%) areas.
- Among the 19% of nets that had been treated since purchase (post-treated), the average amount of time since last treatment was 3.69 months. Nets that were less than 2 years old were post-treated 1-2 times.
- Most treatments were obtained from formal (28%) and informal (22%) commercial sources, including markets (17%) and general shops (16%). Some (13%) were obtained from non-commercial, public sources such as clinics (12%). In urban areas, treatments were generally obtained from commercial sources, whereas in rural areas treatments were generally obtained from public sources. Respondents were generally unaware of what product was used to treat the net.
- Forty-one percent (41%) of the households did not know the cost of the insecticide treatment. Twenty-one percent (21%) reported that they obtained their net treatment free of charge. Those who reported a price said they paid on average 1.73 USD per insecticide treatment.
- For half (50%) of the treated nets, respondents did not know the number of times the net was washed since it was last treated. Twelve percent (12%) of nets were not washed since last treated, 29% were washed 1-2 times, and 6% were washed 3-4 times.

Table 41: Awareness of insecticide treated mosquito nets

Among all respondents

	Site					Location				Urban/Rural		Socio-Economic Status					
	Total	Maputo	Beira	Queli- mane	Tete	Nam- pula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599	199	200	200	201	199
Yes	28.2	29.9	17.6	51	23.6	18.8	28.4	35	26.7	23	33.5	24.7	13.6	26	26	32.8	42.7
No	71.6	70.1	82.4	49	76.4	80.2	71.6	65	73.3	77	66	75.3	86.4	74	74	66.7	56.8
Not Answered	0.2	0	0	0	0	1	0	0.6	0	0	0.5	0	0	0	0.5	0.5	

Table 42: Household ownership of treated (pre and/or post) mosquito nets

Among all households

	Site					Location				Urban/Rural		Socio-Economic Status					
	Total	Maputo	Beira	Queli- mane	Tete	Nam- pula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599	199	200	200	201	199
Yes	7.2	8.3	4	11	8	4.6	4.9	10.3	6	5.7	9.3	5.8	1	4.5	6	8.5	16.1
No	92.8	91.7	96	89	92	95.4	95.1	89.7	94	94.3	90.8	94.2	99	95.5	94	91.5	83.9

Table 43: Nets ever treated (pre and/or post)  
Among total number of nets owned

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Maputo	Beira	Queli- mane	Tete	Nam- pula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>BASE</b>	403	114	57	94	64	74	28	180	100	95	208	195	11	43	71	114	164
Yes	25.6	33.3	24.6	35.1	39.1	12.2	14.3	27.2	22	29.5	25.5	25.6	18.2	27.9	21.2	23.7	28.7
No	74.4	80.7	75.4	64.9	60.9	87.8	85.7	72.8	78	70.5	74.5	74.4	81.8	72.1	78.9	76.3	71.3

Table 44: Ownership of pretreated mosquito nets  
Among total number of nets owned

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Queli- mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	403	114	57	94	64	74	28	180	100	95	208	195
Yes	17.9	16.7	17.5	26.6	25	2.7	3.6	16	19	24	14.4	21.5
No	63.3	61.4	70.2	54.3	56.3	78.4	75	62	60	65	63.9	62.6
Don't know	18.9	21.9	12.3	19.1	18.8	18.9	21.4	22	21	11	21.6	15.9

Table 45: Ownership of post-treated mosquito nets  
Among total number of nets owned

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Queli- mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	403	114	57	94	64	74	28	180	100	95	208	195
Yes	18.9	12.3	17.5	23.4	34.4	10.8	10.7	21	18	18	19.7	17.9
No	71.7	71.9	77.2	70.2	59.4	79.7	75	71	71	73	71.6	71.8
Don't know	9.4	15.8	5.3	6.4	6.3	9.5	14.3	7.8	11	9.5	8.7	10.3

Table 46: Treatment patterns  
Among total number of nets owned

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Maputo	Beira	Queli- mane	Tete	Nam- pula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>BASE</b>	403	114	57	94	64	74	28	180	100	95	208	195	11	43	71	114	164
Bought untreated and never treated	74.4	80.7	75.4	64.9	60.9	87.8	85.7	72.8	78	70.5	74.5	74.4	81.8	72.1	78.9	76.3	71.3
Bought pretreated and never treated	6.7	7	7	11.7	4.7	1.4	3.6	6.1	4	11.6	5.8	7.7	9.1	14	8.5	1.8	7.3
Bought pretreated and post-treated	11.2	9.6	10.5	14.9	20.3	1.4	0	10	15	12.6	8.7	13.8	9.1	11.6	9.9	9.6	12.8
Bought untreated and post-treated	7.7	2.6	7	8.5	14.1	9.5	10.7	11.1	3	5.3	11.1	4.1	0	2.3	2.8	12.3	8.5

Table 47: Average number of months ago net was last treated  
Among nets that were post-treated

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Queli- mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	76	14	10	22	22	8	3	38	18	17	41	35
0 (within the last month)	1.3	7.1	0	0	0	0	33.3	0	0	0	2.4	0
1-2	30.3	0	80	45.5	13.6	25	0	42.1	27.8	11.8	39	20
3-4	35.5	42.9	0	45.5	40.9	25	0	23.7	44.4	58.8	22	51.4
5-6	1.3	7.1	0	0	0	0	33.3	0	0	0	2.4	0
7-8	2.6	14.3	0	0	0	0	0	0	0	11.8	0	5.7
9-10	5.3	7.1	0	0	13.6	0	0	7.9	5.6	0	7.3	2.9
11-12	0	0	0	0	0	0	0	0	0	0	0	0
13-18	3.9	0	0	0	0	37.5	0	7.9	0	0	7.3	0
Average months ago	3.69	4.64	1.13	2.45	4.2	7.57	3	4.03	3.07	3.64	3.97	3.36
Don't know	19.7	21.4	20	9.1	31.8	12.5	33.3	18.4	22.2	17.6	19.5	20

Table 48: Average number of times net was treated since purchase by age of net  
Among nets that were post-treated

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
All nets (n=76)	1.67	1.75	1.25	1.89	1.62	1.57	1.5	1.71	1.71	1.56	1.7	1.63
0 - <1 year (n=28)	1.52	1	1	1.91	1	1.67	0	1.56	1.25	1.83	1.56	1.5
1 - <2 years (n=19)	1.42	1.4	1.25	2.33	1.14	0	1.5	1.5	2	1	1.5	1.2
2 - <3 years (n=16)	1.46	1	0	1.5	1.5	1.5	0	1.25	1	2	1.25	1.8
3 - <4 years (n=4)	2	3	0	1	1	0	0	0	3	1	0	2
4 - <5 years (n=2)	2	2	0	0	0	0	0	0	2	0	0	2
5+ years (n=3)	4	0	0	0	4	0	0	4	0	0	4	0

Table 49: Product used to treat net  
Among nets that were post-treated

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	76	14	10	22	22	8	3	38	18	17	41	35
KO Tab	1.3	0	10	0	0	0	0	2.6	0	0	2.4	0
Powerchem	3.9	0	0	13.6	0	0	0	0	5.6	11.8	0	8.6
RAID product 1	3.9	0	0	0	9.1	12.5	0	2.6	0	11.8	2.4	5.7
RAID product 2	3.9	0	0	0	13.6	0	0	7.9	0	0	7.3	0
Other	2.6	14.3	0	0	0	0	66.7	0	0	0	4.9	0
Don't Know	84.2	85.7	90	86.4	77.3	87.5	33.3	86.8	94.4	76.5	82.9	85.7

Table 50: Place where insecticide treatment was obtained  
Among all nets that were post-treated

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	76	14	10	22	22	8	3	38	18	17	41	35
Market	17.1	7.1	10	27.3	4.5	50	33.3	13.2	22.2	17.6	14.6	20
Kiosk	0	0	0	0	0	0	0	0	0	0	0	0
Street vendor	5.3	0	10	13.6	0	0	0	10.5	0	0	9.8	0
General shop	15.8	7.1	10	4.5	36.4	12.5	33.3	23.7	0	11.8	24.4	5.7
Textile shop	3.9	0	10	0	9.1	0	0	2.6	0	11.8	2.4	5.7
Wholesaler	5.3	7.1	0	0	13.6	0	33.3	7.9	0	0	9.8	0
Pharmacy	2.6	7.1	10	0	0	0	0	2.6	5.6	0	2.4	2.9
Drug store	0	0	0	0	0	0	0	0	0	0	0	0
Supermarket	0	0	0	0	0	0	0	0	0	0	0	0
Mini-mart	0	0	0	0	0	0	0	0	0	0	0	0
Project	0	0	0	0	0	0	0	0	0	0	0	0
Clinic	11.8	28.6	10	18.2	0	0	0	0	27.8	23.5	0	25.7
School	0	0	0	0	0	0	0	0	0	0	0	0
Gift	3.9	0	0	4.5	4.5	12.5	0	7.9	0	0	7.3	0
Employer	1.3	0	0	4.5	0	0	0	0	0	5.9	0	2.9
Don't Know	32.9	42.9	40	27.3	31.8	25	0	31.6	44.4	29.4	29.3	37.1

Table 51: Type of source where insecticide treatment was obtained  
Among all nets that were post-treated

	Site						Location				Urban/Rural		Socio-Economic Status				
	Total	Maputo	Beira	Queli- mane	Tete	Nam- pula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>BASE</b>	76	14	10	22	22	8	3	38	18	17	41	35	1	6	9	25	35
Informal Commercial Source	22.4	7.1	20	40.9	4.5	50	33.3	23.7	22.2	17.6	24.4	20	0	50	33.3	24	14.3
Formal Commercial Source	27.6	21.4	30	4.5	59.1	12.5	66.7	36.8	5.6	23.5	39	14.3	0	33.3	11.1	36	25.7
Non Commercial Source	13.2	28.6	10	22.7	0	0	0	0	27.8	29.4	0	28.6	100	0	22.2	0	20
Gift	3.9	0	0	4.5	4.5	12.5	0	7.9	0	0	7.3	0	0	0	0	0	8.6
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Don't Know	32.9	42.9	40	27.3	31.8	25	0	31.6	44.4	29.4	29.3	37.1	0	16.7	33.3	40	31.4

Table 52: Cost of insecticide treatment (Meticals)  
Among nets that were post-treated

	Site						Location				Urban/Rural		Socio-Economic Status				
	Total	Maputo	Beira	Queli- mane	Tete	Nam- pula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>BASE</b>	76	14	10	22	22	8	3	38	18	17	41	35	1	6	9	25	35
Mean	28310	12778	21250	50250	41875	0	25000	38214	7100	70000	35882	17583	0	0	6500	32727	31071
Standard Deviation	22919	10341	14577	33420	20863	0	8660	19769	3281	0	18811	24663	0	0	4359	21138	24743
Trade/barter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Free	21.1	7.1	0	22.7	27.3	50	0	21.1	22.2	23.5	19.5	22.9	0	33.3	22.2	8	28.6
Don't Know	40.8	28.6	20	59.1	36.4	50	0	42.1	22.2	64.7	39	42.9	100	66.7	33.3	48	31.4

Table 53: Cost of insecticide treatment (USD)  
Among nets that were post-treated

	Site						Location				Urban/Rural		Socio-Economic Status				
	Total	Maputo	Beira	Queli- mane	Tete	Nam- pula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>BASE</b>	76	14	10	22	22	8	3	38	18	17	41	35	1	6	9	25	35
Mean	1.73	0.78	1.3	3.07	2.56	0	1.52	2.33	0.44	4.27	2.19	1.07	0	0	0.4	2	1.9
Standard Deviation	1.4	0.63	0.89	2.04	1.27	0	0.53	1.21	0.2	0	1.15	1.5	0	0	0.27	1.29	1.51
Trade/barter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Free	21.1	7.1	0	22.7	27.3	50	0	21.1	22.2	23.5	19.5	22.9	0	33.3	22.2	8	28.6
Don't Know	40.8	28.6	20	59.1	36.4	50	0	42.1	22.2	64.7	39	42.9	100	66.7	33.3	48	31.4

Table 54: Number of times net washed since last (pre or post) treated  
Among all treated nets

	Site						Location				Urban/Rural	
	Total	Maputo	Beira	Queli- mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	103	22	14	33	25	9	4	49	22	28	53	50
0	11.7	13.6	14.3	9.1	12	11.1	0	12.2	9.1	14.3	11.3	12
1-2	29.1	31.8	28.6	39.4	20	11.1	25	26.5	40.9	25	26.4	32
3-4	5.8	4.5	0	12.1	4	0	0	4.1	4.5	10.7	3.8	8
5-6	0	0	0	0	0	0	0	0	0	0	0	0
7-8	2.9	0	0	9.1	0	0	0	2	0	7.1	1.9	4
9-10	0	0	0	0	0	0	0	0	0	0	0	0
11-12	0	0	0	0	0	0	0	0	0	0	0	0
13-18	0	0	0	0	0	0	0	0	0	0	0	0
19-24	0	0	0	0	0	0	0	0	0	0	0	0
25+	1	4.5	0	0	0	0	25	0	0	0	1.9	0
Mean (excluding 0)	3.3	6.78	1.25	2.65	2	1	24	2	1.5	3.08	4.44	2.36
Mean (including 0)	2.54	5.08	0.83	2.3	1.33	0.5	24	1.45	1.25	2.31	3.33	1.86
Don't know	49.5	45.5	57.1	30.3	64	77.8	50	55.1	45.5	42.9	54.7	44

## 4.7 APPROPRIATE USE

Although it is beneficial for any household member to sleep under a net, it is particularly important for those vulnerable to serious cases of malaria—children under five and pregnant women—to do so. This section reports on “appropriate use” of nets by looking at various measures of use by households, children under five, women of reproductive age, and pregnant women. Some of the measures use the household as the denominator (unit of analysis), while others use number of individuals in the vulnerable group as the denominator. Measures have been calculated to indicate use of any net, and then, specifically, use of a treated net.

The sample was limited to women of reproductive age (WRA)—age 15 to 49—so that net use by WRA could be calculated in addition to net use by pregnant women. The greatest public health impact for women and neonates is achieved when treated nets are used from the beginning of the pregnancy; however, many women do not realize they are pregnant, or do not wish to make their pregnancy public, for several months or more. Therefore, it is advisable for all women of reproductive age to sleep under treated nets nightly.

### Overall household use

There were a total of 5709 people in all households and 1586 people in net-owning households sampled.

- Among 1586 people living in net-owning households, 39% had slept under a net the prior night. This represents 11% of all people living in the households sampled.
- Children under two and pregnant women were most likely to sleep under a net (although denominators for pregnant women are very small, making it difficult to draw definite conclusions). Children over five were the family members least likely to sleep under a net.
- Eleven percent (11%) of people in net-owning households slept under a *treated* net the prior night, representing 3% of all people living in households sampled.

### Use by children under age five

There were 1,388 children under age five in all households and 363 children under age five in net-owning households. (Note that in order to be included in the sample, a child aged 0-4 had to reside in the household).

- Among the 363 children under five in net-owning households, 48% had slept under a net the prior night. This represents 13% of all children under five in the sample.
- Only 14% of children under five in net-owning households had slept under a *treated* net the prior night, representing 4% of all children under five in the sample.
- Children under age two were more likely to be placed under a net than children age three and four. Fifty-six percent (56%) of the former group and forty-one percent (41%) of the later had slept under a net the night prior.
- The youngest children were most likely to be placed under a *treated* net. In net-owning households, 22% of children under age one slept under a *treated* net the prior night. In contrast, only 9% of children age four slept under a *treated* net the prior night.

- The proportion of net-owning households where all children under five slept under a net (treated or untreated) the prior night decreased the more children the household had. For example, in only 21% of net-owning households with three or more children, all children under five slept under a net the prior night, whereas in 52% of net-owning households with one child under five that child slept under a net the night prior. Similarly, in none (0%) of the net-owning households with three or more children under five, all children under five slept under a *treated* net the night prior, whereas in 17% of net-owning households with one child under five that child slept under a *treated* net the prior night.

### Use by women of reproductive age and pregnant women

All households had at least one woman of reproductive age, since a criterion for selection was to be a WRA responsible for a child under five. The total number of women of reproductive age in the households sampled was 1,552. The number of WRAs among net-owning households was 452. The total number of pregnant women in the households sampled was 160 and, of these, 54 were from net-owning households.

- Forty-six percent (46%) of WRA in net-owning households slept under a net the prior night. This represents 13% of the total sample. Only 14% of WRA in net-owning households slept under a treated net the prior night. This represents 4% of the total sample.
- Fifty-six percent (56%) of pregnant women in net-owning households slept under a net the prior night. This represents 19% of the total sample. Only 17% of pregnant women in net-owning households slept under a *treated* net the prior night. This represents 6% of the total sample. (The denominators for pregnant women, however, were very small.)
- A somewhat higher proportion of adult females (45%) than males (37%) slept under a net the prior night in net-owning households.

### Net sleeping patterns

- The average number of people sleeping under nets of different sizes was: king (2.24), double (2.18), and single (1.86). Some nets had not been used the prior night: 19% of king-sized nets, 23% of double nets, and 42% of single nets.
- The average number of months per year people in the household slept under mosquito nets was 6.32.

Table 55: Proportions of household members who slept under a net last night  
Among specific household members

	Household members in net-owning households			Household members in all households		
	Base	% sleeping under any net (n)	% sleeping under treated net (n)	Base	% sleeping under any net (n)	% sleeping under treated net (n)
<b>ALL</b>	1586	39% (621)	11% (174)	5709	10.9% (621)	3%(174)
<b>Adults (age 15+)</b>						
Males	346	37.0% (128)	10.4% (36)	1227	10.4% (128)	2.9% (36)
Females	478	44.6% (213)	13.6% (65)	1662	12.8% (213)	3.9% (65)
Females ages 15-49	452	46.0% (208)	13.7% (62)	1552	13.4% (208)	4% (62)
Pregnant women	54	55.6% (30)	16.7% (9)	160	18.8% (30)	5.6% (9)
<b>Older children (ages 5-14)</b>						
Males	182	23.1% (42)	8.8% (16)	697	6% (42)	2.3% (16)
Females	217	29.5% (64)	3.7% (8)	735	8.7% (64)	1.1% (8)
<b>Younger children (ages 0-4)</b>						
All	363	47.9% (174)	13.5% (49)	1388	12.5% (174)	3.5% (49)
Males	177	49.7% (88)	13.6% (24)	684	12.9% (88)	3.5% (24)
Females	186	46.2% (86)	13.4% (25)	704	12.2% (86)	3.6% (25)
Age 0 - <1	59	55.9% (33)	22% (13)	192	17.2% (33)	6.8% (13)
Age 1 - <2	59	55.9% (33)	18.6% (11)	211	15.6% (33)	5.2% (11)
Age 2 - <3	70	51.4% (36)	14.3% (10)	315	11.4% (36)	3.2% (10)
Age 3 - <4	88	38.6% (34)	8% (7)	326	10.4% (34)	2.1% (7)
Age 4 - <5	87	43.7% (38)	9.2% (8)	344	11% (38)	2.3% (8)

Table 56: Proportions of vulnerable groups who slept under a net last night  
Among persons most vulnerable to severe malaria

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>Children (0-4)</b>																	
Any (n=174)	47.9	37	56.1	67.1	57.1	30.6	35.7	54.9	46.2	42.9	51.7	44.5	23.1	44	39.5	54.3	52.6
Treated (n=49)	13.5	10.2	12.2	20.3	22.2	4.2	7.1	15.3	11.8	14.3	14	13.1	7.7	20	9.9	12.4	14.9
<b>Females (15-49)</b>																	
Any (n=208)	46	36	50.8	57.3	50	42.4	25	49.8	49.5	43.9	45.4	46.8	13.3	46.9	39.8	49.6	49.4
Treated (n=62)	13.7	8.8	9.8	23.6	20.5	8.1	4.5	14.6	13.3	16.3	12.9	14.8	6.7	18.4	8.6	10.9	18.1
<b>Pregnant Women</b>																	
Any (n=30)	55.6	55.6	70	80	33.3	40.9	0	58.1	61.5	44.4	56.3	54.5	0	100	30.8	55.6	68.2
Treated (n=9)	16.7	0	20	60	0	4.5	0	19.4	7.7	22.2	18.8	13.6	0	100	0	5.6	31.8

Table 57: Proportion of net-owning households in which none, some, or all children under five slept under a net last night  
Among net-owning households with children under age 5

	% Sleeping under any net			% Sleeping under treated net		
	None	Some	All	None	Some	All
<b>Number of net-owning households with 1, 2 or 3+ children under age 5</b>						
1 (n=149)	48.3	---	51.7	82.6	---	17.4
2 (n=82)	41.5	26.8	31.7	80.5	11	8.5
3+ (n=28)	32.1	46.4	21.4	96.4	3.6	0

Table 58: Mean number of people sleeping under a net, by net size  
Among household members sleeping under specific size nets

	Size of net		
	King	Double	Single
<b>BASE</b>	91	213	64
None (%)	18.7	22.5	42.2
Mean (excluding 0)	2.24	2.18	1.86
Standard deviation	0.95	1.06	0.92
Median value	1.68	1.55	1.31

Table 59: Number of months per year people in household sleep under a net  
Among net-owning households

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	265	74	32	62	45	52	20	116	67	62	136	129
None (%)	4.9	12.2	3.1	0	4.4	1.9	15	1.7	4.5	8.1	3.7	6.2
Mean (excluding 0)	6.32	5.89	6.87	6.08	5.81	7.29	5.47	6.6	6.1	6.27	6.45	6.18
Standard Deviation	3.43	2.87	4.15	3.85	3.04	3.27	3.18	3.49	3.47	3.36	3.46	3.4

## 4.8 CONSUMER MOSQUITO NET PREFERENCES

The prior section described the characteristics of nets owned, which is to a large extent a reflection of types of nets currently available. This section reports on questions regarding the characteristics of nets that consumers *prefer*. These questions were asked of all respondents, whether or not their household owned a net. The information in this section will be used to develop nets with features that consumers want.

## Net shape and size preferences

- Over half (56%) of the respondents preferred round/conical shaped nets. One-third (33%) preferred rectangular nets. Fewer households preferred triangle/pyramid (4%) or wedge-shaped (4%) nets. Preferences were fairly equally distributed among urban and rural areas.
- Consumers preferred large nets. Over half of the households (54%) preferred king-size nets for their households and 37% preferred double-size nets. Only 5% preferred single-size nets and 2% cot-size nets.

Table 60: Net shape preferences  
Among all respondents

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599
Rectangular	32.7	31.9	33.2	39	28.1	31.5	35.8	35	32.3	29	35.5	30.9
Round/conical	55.6	59.3	56.8	49.5	57.3	54.8	54.3	56	53.7	58	55.5	55.6
Triangle/pyramid	4.2	1.5	2.5	5	5	7.1	1.2	3.8	5.7	4	3.3	4.8
Wedge	3.5	2.9	3	4	3.5	4.1	1.2	2.8	4	4.3	2.5	4.2
Any other	0.4	0	0.5	0.5	0.5	0.5	0	0	0.3	1	0	0.7
No preference	3.6	4.4	4	2	5.5	2	7.4	2.2	4	3.7	3.3	3.8

Table 61: Net size preferences  
Among all respondents

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599
Cot-net	1.9	2	3	1.5	2.5	0.5	3.7	1.9	1.7	1.7	2.3	1.7
Single	5.4	4.9	9	9	3	1	8.6	5.6	3.7	6	6.3	4.8
Double	37.2	37.3	38.2	48	28.1	34.5	29.6	42	33	39	39.5	35.7
King	53.7	53.4	48.2	39.5	64.8	62.4	54.3	49	60.3	52	50	56.1
Other	0	0	0	0	0	0	0	0	0	0	0	0
No preference	1.8	2.5	1.5	2	1.5	1.5	3.7	1.6	1.3	2	2	1.7

## Net color preferences

- The majority of households preferred light-colored mosquito nets. White nets were preferred by 29% of households, pink by 18%, light blue by 16%, and light green by 13%. The majority of households in Maputo proper preferred white nets (59%). In general, preferences for white nets decreased with distance from urban centers. Almost the same proportion of people reported disliking white (27%) nets as liking them (29%).
- The majority of households (66%) reported disliking black colored nets. Twenty-nine percent (29%) disliked dark green; 27% disliked white, 29% dark green, 19% pink, and 17% dark blue nets.

Table 62: Net color preferences  
Among all respondents

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599
White	29.3	39.2	29.1	23	16.1	39.1	59.3	36	24.3	19	41	21.5
Light blue	16.3	13.7	13.6	18	24.1	12.2	12.3	19	14.3	17	17.3	15.7
Dark blue	11.5	13.7	5.5	17.5	10.1	10.7	13.6	13	12	9.4	12.8	10.7
Light green	12.9	9.3	11.6	15.5	14.6	13.7	3.7	9.1	15	17	8	16.2
Dark green	3	4.9	2	4	1	3	1.2	1.6	4.7	3.3	1.5	4
Pink	18.4	15.2	31.7	11.5	27.6	6.1	6.2	17	17	24	15	20.7
Black	6.7	2	3.5	10	4	14.2	1.2	4.7	8.7	8.4	4	8.5
No preference	1.8	2	3	0.5	2.5	1	2.5	0	4	1.3	0.5	2.7

Table 63: Net color dislikes

Among all respondents (multiple responses possible)

	Site					Location				Urban/Rural		
	Total	Maputo	Beira	Queli- mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599
White	27.4	20.1	18.1	36.5	22.6	40.1	17.3	25	30	30	23.8	29.9
Light blue	9.4	9.3	13.6	6.5	10.1	7.6	13.6	7.8	11.3	8	9	9.7
Dark blue	17.2	24	21.1	15.5	14.6	10.7	28.4	16	16.3	16	18.8	16.2
Light green	9.3	17.2	10.6	5.5	8	5.1	25.9	7.2	8	8.4	11	8.2
Dark green	29	45.6	32.7	33.5	20.1	12.7	51.9	28	25.3	28	32.8	26.5
Pink	19.4	34.3	16.1	18	9.5	18.8	55.6	19	15.3	14	26.3	14.9
Black	65.9	77.5	67.3	60	67.3	56.9	82.7	69	63.7	61	71.5	62.1
None	10.9	9.3	11.6	16.5	13.6	3.6	3.7	7.8	13.7	13	7	13.5

## SECTION 5

### OTHER MOSQUITO CONTROL PRODUCTS

In order to understand the role of nets in the larger context of mosquito control products, respondents were asked what mosquito control methods they knew of and used, what attributes of mosquito control they valued the most, and what products and brands they associated with various attributes. This information will be particularly useful for the private sector as it seeks to meet consumer needs.

#### 5.1 AWARENESS OF MOSQUITO CONTROL PRODUCTS AND METHODS

- The commercial mosquito control products respondents were most aware of (unprompted mention) was the mosquito net. Sixty-three percent (63%) mentioned sleeping under a net with 6% specifically mentioning a treated net. The next most commonly mentioned methods were aerosols (45%), and mosquito coils (42%). Awareness of commercial methods decreased with distance from the urban centers.
- Mention of mosquito nets was highest in the Maputo (63%) and Quelimane (75%) sample sites. In addition, mention of mosquito nets was higher in the urban (74%), than rural (55%) areas, and decreased with distance from urban centers.
- A variety of non-commercial methods of mosquito control were mentioned, the most common of which were “close windows and doors” (26%) and “keep surroundings clean” (18%).

Table 64: Awareness of mosquito control products and methods  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Queli- mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599
<b>COMMERCIAL PRODUCTS</b>												
Sleep under a mosquito net (untreated or unspecified)	56.4	62.7	38.7	75	46.7	58.4	65.4	67.4	50.3	48.2	67	49.2
Sleep under an insecticide-treated mosquito net	6.1	5.9	5.5	14.5	1	3.6	6.2	6.6	7.7	4	6.5	5.8
Use mosquito coils	41.6	75.5	44.2	36	37.2	14.2	71.6	46	38	32	51.5	35.1
Use aerosol insecticide	45.3	83.8	36.2	41	38.7	25.9	91.4	52	39.7	31	60	35.6
Use commercial mosquito repellent on body	0	0	0	0	0	0	0	0	0	0	0	0
Use flit gun/spray gun (that you fill yourself)	4	7.8	0	5.5	3	3.6	9.9	5.6	2.3	2.3	6.5	2.3
Have mosquito screens/nets in windows/doors	18.4	42.2	13.1	9	7.5	19.8	51.9	19	15.7	11	25.8	13.5
<b>NON-COMMERCIAL METHODS</b>												
Close windows and doors	25.7	37.3	20.6	11	17.6	42.1	45.7	32	20.7	19	34.5	19.9
Burn things	0	0	0	0	0	0	0	0	0	0	0	0
Keep surroundings clean	17.5	26	21.6	11	17.1	11.7	27.2	17	18	15	19.3	16.4
Other non-commercial method	10.3	6.9	12.1	3	22.6	7.1	13.6	7.5	13.3	9.4	8.8	11.4

## 5.2 USE OF COMMERCIAL MOSQUITO CONTROL PRODUCTS

If a respondent was aware of a given mosquito control method, she was asked whether she had used that method in the prior year. Note that these figures may be somewhat lower than actual use, given that “use” was asked only of those who indicated that they were aware of a given product, and level of use was calculated using total number of respondents as the base. Note also that use of nets is covered in Section 4.

- Use of commercial mosquito control products appears to be low: in the last 12 months respondents most often reported having used aerosols (26%) and mosquito coils (25%). Use of commercial mosquito control products was higher in urban than in rural areas.

Table 65: Use of commercial mosquito control products  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599
Use mosquito coils	24.8	56.4	26.6	26	10.6	3.6	46.9	22.9	25.3	20.4	27.8	22.9
Use aerosol insecticide	26	60.3	20.1	23	16.6	9.1	71.6	28.8	20	16.7	37.5	18.4
Use commercial mosquito repellent on body	3.4	5.4	5.5	1.5	4	0.5	3.7	6.9	1.3	1.7	6.3	1.5
Use flit gun/spray gun (that you fill yourself)	1.8	1.5	0	5.5	1	1	3.7	4.1	0.3	0.3	4	0.3
Have mosquito screens/nets in windows/doors	15.8	38.2	11.1	9	7	13.2	50.6	16.6	13	8.4	23.5	10.7
Other commercial method	0.4	0	0	2	0	0	0	0.6	0	0.7	0.5	0.3

## 5.3 FREQUENCY, LOCATION, AND PRICE OF COIL, AEROSOL, AND REPELLANT PURCHASES

### Coils

- Coils were purchased fairly frequently: of the 25% of households that had purchased mosquito coils in the last 12 months, almost half (49%) reported that they bought them in the last week. Frequency of purchase was fairly equal between urban and rural areas.
- The average reported price paid for a single mosquito coil was 0.24 USD, but the price range was large, with a standard deviation of 0.63.
- Consumers tended to buy coils from informal vendors. Sixty-one percent (61%) of the households that purchased coils purchased them in a market and 17% purchased them from a street vendor or a kiosk. In addition, 17% purchased them from a general shop.

Table 66: Frequency of mosquito coil purchase  
Among households that used mosquito coils in the 12 months before the interview

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	248	115	53	52	21	7	38	73	76	61	111	137
Today or yesterday	16.5	12.2	28.3	19.2	9.5	0	5.3	23.3	11.8	21.3	17.1	16.1
Within the last 7 days	32.3	31.3	30.2	36.5	42.9	0	31.6	32.9	34.2	29.5	32.4	32.1
Within the last month	22.2	20	24.5	25	9.5	57.1	28.9	24.7	17.1	21.3	26.1	19
Within the last 3 months	8.1	11.3	3.8	5.8	4.8	14.3	15.8	6.8	7.9	4.9	9.9	6.6
More than 3 months ago	13.7	18.3	3.8	7.7	28.6	14.3	7.9	5.5	22.4	16.4	6.3	19.7
Don't know	7.3	7	9.4	5.8	4.8	14.3	10.5	6.8	6.6	6.6	8.1	6.6

Table 67: Average price of single mosquito coil (USD)  
Among households that bought a single mosquito coil

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	96	38	24	28	2	4	16	29	31	20	45	51
Average price	0.24	0.12	0.19	0.44	0.12	0.31	0.16	0.43	0.11	0.21	0.34	0.15
Standard Deviation	0.63	0.19	0.3	1.07	0	0.26	0.29	1.07	0.1	0.23	0.89	0.16
Median value	0.09	0.06	0.06	0.13	0.12	0.31	0.06	0.09	0.06	0.11	0.09	0.08
Don't Know (%)	5.2	5.3	0	3.6	0	50	6.3	3.4	0	15	4.4	5.9

Table 68: Place where mosquito coils were purchased  
Among households that used mosquito coils in the 12 months before the interview

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	248	115	53	52	21	7	38	73	76	61	111	137
Market	60.9	60.9	73.6	55.8	52.4	28.6	71.1	52.1	80.3	41	58.6	62.8
Kiosk	5.6	6.1	7.5	1.9	9.5	0	5.3	5.5	3.9	8.2	5.4	5.8
Street vendor	10.9	7.8	7.5	21.2	9.5	14.3	18.4	19.2	3.9	4.9	18.9	4.4
General shop	17.3	22.6	5.7	17.3	14.3	28.6	2.6	15.1	6.6	42.6	10.8	22.6
Wholesaler	0	0	0	0	0	0	0	0	0	0	0	0
Pharmacy	0	0	0	0	0	0	0	0	0	0	0	0
Drugstore	0.4	0	0	1.9	0	0	0	1.4	0	0	0.9	0
Supermarket	0.8	0	1.9	0	4.8	0	0	1.4	1.3	0	0.9	0.7
Mini-mart	0.8	0	0	0	4.8	14.3	0	1.4	1.3	0	0.9	0.7
Don't know	3.2	2.6	3.8	1.9	4.8	14.3	2.6	4.1	2.6	3.3	3.6	2.9

## Aerosols

- Of the 26% of households that had purchased aerosols in the last 12 months, 62% had purchased them within the past month, with almost half (50%) reporting having purchased them within the last week. Frequency of purchase was rather similar in urban and rural areas.
- The average reported price was 1.72 USD for a 180-220ml can of aerosol insecticide and 2.10 USD for a 300-350ml can.
- Forty percent (40%) of the households that had purchased aerosols purchased them in a general shop; 32% in a market; and 6% in a supermarket. Purchase of aerosols from a general shop or market was higher among rural than urban households, whereas purchase of aerosols from a supermarket was higher among urban households.

Table 69: Frequency of aerosol insecticide purchase  
Among households that used aerosol insecticides in the 12 months before the interview

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	260	123	40	46	33	18	58	92	60	50	150	110
Today or yesterday	5.4	4.1	10	2.2	6.1	11.1	5.2	8.7	3.3	2	7.3	2.7
Within the last 7 days	26.2	21.1	22.5	37	24.2	44.4	20.7	33.7	25	20	28.7	22.7
Within the last month	30.8	32.5	32.5	32.6	21.2	27.8	27.6	29.3	35	32	28.7	33.6
Within the last 3 months	13.1	17.1	12.5	13	6.1	0	19	7.6	11.7	18	12	14.5
More than 3 months ago	15	17.1	10	6.5	24.2	16.7	17.2	12	20	12	14	16.4
Don't know	9.6	8.1	12.5	8.7	18.2	0	10.3	8.7	5	16	9.3	10

Table 70: Average price of 180-220 ml can of aerosol insecticide (USD)  
Among households that bought a 180-220 ml can of aerosol insecticide

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Queli- mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	106	53	17	17	8	11	26	38	27	15	64	42
Average price	1.72	1.64	1.54	1.82	1.54	2.48	1.53	1.85	1.69	1.72	1.73	1.7
Standard Deviation	0.62	0.39	0.67	0.96	0.61	0.31	0.23	0.84	0.41	0.63	0.69	0.51
Median value	1.52	1.51	1.67	1.4	1.56	2.6	1.49	1.85	1.62	1.67	1.51	1.71
Don't Know (%)	17.0	17	5.9	17.6	25	27.3	19.2	13.2	25.9	6.7	15.6	19

Table 71: Average price of 300-350 ml can of aerosol insecticide (USD)  
Among households that bought a 300-350 ml can of aerosol insecticide

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Queli- mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	141	70	19	22	23	7	32	48	27	34	80	61
Average price	2.1	2.1	2.08	2.16	2.1	1.86	2.09	2.1	2.15	2.04	2.1	2.09
Standard Deviation	0.55	0.45	0.52	0.87	0.57	0.27	0.28	0.65	0.42	0.72	0.53	0.59
Median value	2.06	2.06	1.94	2.29	2.08	1.77	2.04	1.98	2.03	2.04	2.05	2.03
Don't Know (%)	20.6	20	10.5	13.6	34.8	28.6	21.9	20.8	14.8	23.5	21.3	19.7

Table 72: Place where aerosol insecticides were purchased  
Among households that used aerosol insecticides in the 12 months before the interview

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Queli- mane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	260	123	40	46	33	18	58	92	60	50	150	110
Market	32.3	33.3	25	37	33.3	27.8	32.8	28	40	30	30	35.5
Kiosk	3.8	4.1	2.5	0	12.1	0	6.9	3.3	0	6	4.7	2.7
Street vendor	5.4	4.1	2.5	15.2	0	5.6	5.2	9.8	1.7	2	8	1.8
General shop	40.4	39	42.5	41.3	45.5	33.3	32.8	39	45	46	36.7	45.5
Wholesaler	1.5	0.8	0	0	0	16.7	1.7	2.2	1.7	0	2	0.9
Pharmacy	0.8	0.8	2.5	0	0	0	1.7	1.1	0	0	1.3	0
Drugstore	0.8	0	0	4.3	0	0	0	2.2	0	0	1.3	0
Supermarket	6.2	9.8	7.5	0	0	5.6	15.5	4.3	1.7	4	8.7	2.7
Mini-mart	1.5	0	5	0	6.1	0	0	4.3	0	0	2.7	0
Don't Know	7.3	8.1	12.5	2.2	3	11.1	3.4	5.4	10	12	4.7	10.9

## Repellants

- Only 3% of households had purchased repellants in the last 12 months. Among these households, 38% had purchased them within the last month.
- Households that bought repellants in the last 12 months did so most frequently from general shops (27%), supermarkets (15%), open air markets (15%), and street vendors (15%).
- The number of respondents able to recall the price of repellants was too small to permit meaningful calculations.

Table 73: Frequency of insect repellent purchase

Among households that used insect repellents in the 12 months before the interview

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	34	11	11	3	8	1	3	22	4	5	25	9
Today or yesterday	5.9	0	18.2	0	0	0	0	4.5	0	20	4	11.1
Within the last 7 days	8.8	0	18.2	0	12.5	0	0	14	0	0	12	0
Within the last month	23.5	36.4	27.3	33.3	0	0	66.7	18	50	0	24	22.2
Within the last 3 months	32.4	45.5	9.1	66.7	37.5	0	0	27	50	60	24	55.6
More than 3 months ago	26.5	18.2	18.2	0	50	100	33.3	32	0	20	32	11.1
Don't know	2.9	0	9.1	0	0	0	0	4.5	0	0	4	0

Table 74: Place where insect repellents were purchased

Among households that used insect repellents in the 12 months before the interview

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	34	11	11	3	8	1	3	22	4	5	25	9
Market	14.7	27.3	9.1	0	12.5	0	66.7	4.5	25	20	12	22.2
Kiosk	0	0	0	0	0	0	0	0	0	0	0	0
Street vendor	14.7	9.1	9.1	66.7	0	100	0	18	0	20	16	11.1
General shop	26.5	18.2	18.2	0	62.5	0	0	32	25	20	28	22.2
Wholesaler	0	0	0	0	0	0	0	0	0	0	0	0
Pharmacy	5.9	0	9.1	33.3	0	0	0	9.1	0	0	8	0
Drugstore	0	0	0	0	0	0	0	0	0	0	0	0
Supermarket	14.7	18.2	27.3	0	0	0	33.3	14	0	20	16	11.1
Mini-mart	0	0	0	0	0	0	0	0	0	0	0	0
Bought abroad	2.9	0	0	0	12.5	0	0	4.5	0	0	4	0
Don't Know	20.6	27.3	27.3	0	12.5	0	0	18.2	50	20	16	33.3

## 5.4 PERCEPTIONS OF MOSQUITO CONTROL ATTRIBUTES, PRODUCTS, AND BRANDS

### Valued attributes of mosquito control products

Respondents were read a list of attributes of mosquito control products and asked to rate, on a scale of 1-7, how important to them various attributes were.

- Attributes were rated differently in terms of level of importance. “Kills mosquitoes” (6.17) was rated as the most important attribute; the next most highly rated were “kills other insects, other than mosquitoes” (5.75), and “reduces malaria” (5.37). “Is good value for the money” (3.69) was rated as the least important attribute.

Table 75: Mean rating of mosquito control product attributes  
Among all households

	Site					Location				Urban/Rural		
	Total	Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	999	204	199	200	199	197	81	319	300	299	400	599
Kills mosquitoes	6.17	6.24	6.36	5.9	6.25	6.11	6.4	6.24	6.07	6.14	6.27	6.1
Keeps mosquitoes away for a long time	5.26	4.82	5.68	5.12	5.48	5.2	4.75	5.41	5.23	5.25	5.28	5.24
Keeps mosquitoes away while sleeping	4.95	4.56	5.38	4.82	5.51	4.48	4.58	5.17	4.98	4.78	5.05	4.88
Kills other insects, other than mosquitoes	5.75	5.97	6.06	5.43	5.79	5.48	6.02	6.01	5.61	5.53	6.01	5.57
Is safe to use around children	4.10	4.47	3.95	4.01	4.32	3.74	4.36	3.76	4.39	4.1	3.88	4.25
Is a good value for the money	3.69	3.69	4.44	3.69	4.05	2.54	3.74	3.73	3.75	3.57	3.73	3.66
Is a long-term solution to mosquito problems	4.82	5.1	5.32	4.96	5.35	3.37	5.27	4.96	4.77	4.61	5.02	4.69
Is a high quality and effective brand	4.53	4.86	5.13	4.87	4.77	3.01	5.12	4.71	4.41	4.3	4.8	4.36
Reduces malaria	5.37	5.89	5.53	5.68	5.22	4.48	5.56	5.27	5.49	5.29	5.33	5.39

### Association of attributes with mosquito control products

Respondents were read statements and asked which type of mosquito control product they thought of when they heard each attribute. They could indicate more than one product. (Note that the base is respondents who were aware of a given product when prompted, and the table indicates the percentage of those respondents selecting a given product when a particular attribute was named.)

- Ratings for mosquito nets exceeded all other products on “keeps mosquitoes away for a long time” (53%), “keeps mosquitoes away while sleeping” (70%), “is safe to use around children” (55%), is a long-term solution to mosquito problems (43%), “is a high quality/effective brand” (42%), and “reduces malaria” (45%).
- Sprays/aerosols were the products most associated with “kills mosquitoes” (88%), “kills other insects, other than mosquitoes” (78%), and “is a high quality/effective brand” (42%).
- Coils were seen as being the best “value for the money” (33%).

Table 76: Association of mosquito control products and attributes  
Among respondents who are aware of specific mosquito control products

	Mosquito coil	Sprays/ Aerosol	Repellant	Mosquito Net	Window/ Door Screens	None	Don't Know
<b>BASE</b>	758	728	323	832	636	999	999
Kills mosquitoes	43.5	87.5	26.9	10.8	5.2	3.2	8.4
Keeps mosquitoes away for a long time	47.6	28.8	32.2	52.9	34.6	2.4	11
Keeps mosquitoes away while sleeping	39.1	25.1	33.7	69.6	35.4	1.6	8.9
Kills other insects, other than mosquitoes	20.7	77.9	11.8	10.1	5.7	5.5	15.8
Is safe to use around children	21.5	9.5	21.7	55.3	40.9	5.6	18.9
Is a good value for the money	32.5	17.4	9	23.6	15.7	11.7	27.8
Is a long-term solution to mosquito problems	13.1	29.9	10.5	43.1	28	8.8	22
Is a high quality/ effective brand	19.5	42.4	12.4	26.8	12.7	4.6	24.5
Reduces malaria	22.8	37	25.1	45.1	28	7.8	27.7

## Awareness of mosquito control brands

Respondents were asked to name the brands of mosquito control products they were aware of, even if they didn't use them. After providing their responses, they were shown a card with the name and logo of different brands and were asked to indicate which other brands, apart from the ones they already mentioned they were aware of. The following tables show respondent awareness by unprompted, prompted, and total awareness.

- Spontaneous (unprompted) awareness was highest for Baygon (73%). Only 2-15% spontaneously mentioned Doom (15%), Raid (3%), Target (3%), and Fastkill (2%).
- Additional levels of brand name awareness when prompted with a show card were: Doom (30%), Baygon (11%), Target (11%), Raid (7%), and Fastkill (6%).
- Total awareness, as calculated by the sum of unprompted and prompted responses, was highest for Baygon (84%) and Doom (46%). Few respondents were aware of Target (15%), Raid (10%), and Fastkill (8%).
- Overall awareness of brands was higher in urban than in rural areas.

Table 77: Awareness of mosquito control product brand names, unprompted  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599
Baygon	73.1	90.7	77.4	62.5	67.3	67	93.8	86.5	67.3	58.9	88	63.1
Doom	15.3	20.6	24.6	4.5	20.6	6.1	32.1	19.4	12	9.7	22	10.9
Raid	2.7	0	6	3	4.5	0	0	4.7	2	2	3.8	2
Target	3.4	1	7.5	1	6	1.5	2.5	6.3	2.3	1.7	5.5	2
Fastkill	2.2	0.5	6.5	0	4	0	1.2	3.4	2	1.3	3	1.7
Other	11.9	2.5	18.6	31.5	5.5	1.5	4.9	12.5	14.7	10.4	11	12.5

Table 78: Awareness of mosquito control product brand names, prompted  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599
Baygon	11.3	9.3	8	25	3	11.2	6.2	7.2	18.7	9.7	7	14.2
Doom	30.3	64.7	21.1	39.5	11.1	14.2	54.3	28.5	29.7	26.4	33.8	28
Raid	6.9	7.8	11.1	10	1	4.6	6.2	11.6	3	6	10.5	4.5
Target	11.3	30.4	10.6	13	1	1	44.4	10.3	7.3	7.4	17.3	7.3
Fastkill	5.7	11.3	7	7	2	1	14.8	7.8	4	2.7	9.3	3.3

Table 79: Awareness of mosquito control product brand names, total  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Maputo	Beira	Quelimane	Tete	Nampula	Maputo Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	999	204	199	200	199	197	81	319	300	299	400	599
Baygon	84.4	100	85.4	87.5	70.4	78.2	100	93.7	86	68.6	95	77.3
Doom	45.6	85.3	45.7	44	31.7	20.3	86.4	48	41.7	36.1	55.8	38.9
Raid	9.6	7.8	17.1	13	5.5	4.6	6.2	16.3	5	8	14.3	6.5
Target	14.7	31.4	18.1	14	7	2.5	46.9	16.6	9.7	9	22.8	9.3
Fastkill	7.9	11.8	13.6	7	6	1	16	11.3	6	4	12.3	5

## Mosquito control brand name associations

Respondents were read a series of attributes and asked to indicate which brand(s) they associated with the attribute. The following table provides attributes by total (sum of unprompted and prompted) awareness.

- For all attributes, except “is safe to use around children” Baygon ranked highest. None of the brands ranked highly for the attribute “is safe to use around children.” Most people said “none” of the brands was safe to use around children or that they “didn’t know” which of the brands were safe.

Table 80: Mosquito control product attribute and brand name association, total  
Among respondents who were aware (unprompted and prompted) of specific mosquito control product brand names

	Baygon	Doom	Raid	Target	Fastkill	None	Don't Know
<b>BASE</b>	843	456	96	147	79	999	999
Kills mosquitoes	90.2	59.9	31.3	39.5	44.3	1	7.5
Keeps mosquitoes away for a long time	58.7	46.9	20.8	30.6	29.1	6.5	17.8
Keeps mosquitoes away while sleeping	58.4	40.1	32.3	34.7	29.1	9	18.3
Kills other insects, other than mosquitoes	77.3	49.3	27.1	42.9	36.7	2.2	13.6
Is safe to use around children	20.6	12.1	10.4	9.5	6.3	32.4	31.6
Is a good value for the money	43.5	21.7	16.7	12.2	11.4	15.3	29
Is a long-term solution to mosquito problems	49.1	27.4	18.8	23.1	21.5	12.8	25
Is a high quality/ effective brand	65.5	26.3	16.7	23.1	12.7	3.2	22.3
Reduces malaria	55.4	36.2	17.7	33.3	26.6	9.8	26.6

## SECTION 6

### PROGRAM AND PRODUCT IMPLICATIONS

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#### 6.1 GENERAL

A number of factors make this a favorable setting for ITM promotion and sales, but efforts are needed to increase availability and access to ITMs, to overcome some negative perceptions of nets and net treatments, to increase awareness of ITMs, and to stimulate product demand.

The favorable factors for ITM promotion and sales are:

- High awareness of malaria and some understanding that mosquitoes cause malaria
- Nets viewed extremely positively — more positively than any other insect control product (except that aerosols are perceived as doing a better job of killing mosquitoes and other insects)
- A “net culture” is already being established; about one-fourth of all households already own at least one net and the majority were acquired in the last two years
- Evidence of higher rates of net ownership where they have been promoted
- Strong valuing of the product attributes that *insecticide treated nets* deliver (e.g., killing mosquitoes; repelling mosquitoes, working better at preventing malaria than untreated nets)
- High level of perceived advantages and low level of perceived disadvantages of nightly use of treated nets by vulnerable groups
- A non-specialized insect control product market — nets and other insect control products are already sold in the same outlets

Important barriers to overcome for ITM promotion and sales are:

- Cost of nets and perception (by some) that they are not affordable
- Limited access to nets (time to nearest purchase site is long)
- In some sites nets are being provided by public sector (e.g., health services or project) and through the commercial sector on a subsidized basis — people are used to getting nets for little or no money
- Lack of variety in net size, color, and shape among available nets
- Low levels of awareness of insecticide treated nets
- Concerns about safety and potential adverse health effects of insecticide treatments, particularly with regard to young children and pregnant women
- Inadequate levels of ITM use by children under five, women of reproductive age, and pregnant women
- Inadequate rates of net treatment/re-treatment
- Lack of strong branding of nets and insecticide treatments
- Erroneous beliefs about non-mosquito related causes of malaria; inadequate levels of knowledge of groups most vulnerable to severe malaria
- Only moderate exposure to malaria prevention messages

Specific program and product implications from the baseline study presented in this report are outlined below.

## 6.2 KNOWLEDGE AND BELIEFS ABOUT MALARIA AND MOSQUITOES

- Recognition of the Portuguese term for malaria — “paludismo”— was very high, demonstrating that the term can be used in health promotion activities and will be widely understood. Use of a single term around which educational efforts can build a common understanding will be very important for promoting behavior change. Symptoms associated with “paludismo” were generally consonant with the biomedical definition of malaria, indicating that identification of the illness is good, and little time needs to be spent on educating people to recognize signs. The only exception is low mention of convulsions, a symptom of severe malaria; there is need to link convulsions with malaria in public education efforts.
- Despite the fact that a high percentage of respondents knew that mosquitoes cause malaria, many people erroneously believed that there were other causes of malaria as well, especially living in dirty surroundings or near standing water, being in the rain, and getting hot/sun overexposure. Malaria prevention efforts should emphasize that mosquitoes cause malaria and that they are the *only* cause of malaria, dispel erroneous beliefs about other causes, and stress that environmental management measures (such as reducing amounts of standing water) can help reduce nuisance biting by mosquitoes that do not carry the malaria parasite but do not reduce malaria. It would also be important to convey the fact that night-biting mosquitoes are the ones that transmit malaria.
- Knowledge of the groups most vulnerable to severe cases of malaria was moderate. Efforts to promote ITM acquisition and proper use can build on the existing perception that children are particularly vulnerable, but must emphasize the special vulnerability of children *under five* and pregnant women to suffering severe consequences of malaria.
- Exposure to information about malaria prevention was moderate and lower in far rural areas than elsewhere. Information was being transmitted largely through the radio and through health facilities. Friends and neighbors also played an important part in providing information about malaria prevention messages, though the accuracy of information transmitted by them is unknown. Increased exposure to accurate malaria prevention messages is still needed, especially in far rural areas. A coordinated strategy that provides information from a variety of media and interpersonal sources is likely to be effective.

## 6.3 MOSQUITO NETS

### Perceived advantages and disadvantages of treated/untreated net use by vulnerable groups

- Almost all respondents perceived advantages of net/ITN use by vulnerable groups — children under five and pregnant women. Promotional efforts designed to achieve nightly or year round net use by these groups can build on respondents’ perceptions that nets provide good protection against mosquitoes, other insects, and malaria.
- *Treated* nets were seen as especially effective in providing good protection against mosquitoes and malaria, with the added advantage of killing and repelling mosquitoes. Treated nets should be marketed as having these added advantages that consumers already like, as this will be a likely motivator to their use. Since net treatments are not visible, and people do not expect nets to have insecticide properties, it will be important to find strategies for product trials — possibly among opinion leaders — so that consumers see that treated nets deliver what they most want in a mosquito control product.

- Few respondents cited any disadvantages of a child under five sleeping under a net, but among those the main disadvantage were that mosquitoes still make noise around the net, that it is hot sleeping under a net, and that it takes time to tuck the net in each night. These perceived disadvantages should be addressed in promotional activities as well as in product formulation. However, product modification should be addressed in light of any cost increases they would involve.
- Although most respondents did not cite disadvantages of *treated* nets, those who did voiced concern about the noxious smell and potential danger of the insecticide to young children and pregnant women. Negative perceptions of treated nets appear to be based on previous experience with aerosols and coils (e.g., smell, irritation, and adverse health effects). Since smell and irritation are mild and transient in treated nets, negative perceptions are likely to be overcome when products are actually used. Promotional strategies should emphasize opportunities for product trial. In addition, IEC messages and product development should take into account consumer concerns about smell and safety. At the same time, since the smell of the insecticide dissipates shortly after treatment, consumers may think that the insecticide is no longer effective; some means should be found to indicate to the consumer that insecticide is present and still effective.

### Access to ITMs

- There was a great range in the amount of time consumers would have to travel to find a net: Over half could walk to a place where they could purchase a net in approximately ½ of an hour. Others would need to take approximately 1¼ hours by bus, with those in the far rural areas requiring 2½ hours by bus to obtain their nets. Fairly large portions of nets in Maputo and surrounding areas as well as in far rural areas were provided by the public sector. Insecticide treatments for nets were available in both the public and commercial sectors, but more needs to be done to increase availability of nets and treatments through the commercial sector, bringing them closer to where people live, with particular attention to far rural areas.
- Many people, especially those living in Maputo and surrounding areas, as well as rural areas, said that nets were not available or that they did not know where they could be obtained. It is key to improve ITM supply and let people know where nets and treatments can be obtained.

### Mosquito net ownership, treatment, and appropriate use

- Net ownership in the study was moderate, especially in the Maputo and Quelimane sites. Non-owners, especially those in rural areas, said that the main reason they did not own a net was cost. A key challenge to increasing net ownership will be to make nets more affordable and countering perceptions of nets as unaffordable, given that nearly two-thirds of the people even in the highest SES category cited cost as a barrier to net ownership. Currently, in some areas (i.e. Maputo site) a fairly large portion of nets is being provided by the public sector (e.g., health services, projects, and clinics), with the result that many people expect the cost of nets to be low. Commercial nets will need to be priced competitively with those distributed through the public sector or they must be seen as being sufficiently more desirable to warrant paying more for them. Possibly commercial nets would be seen as reasonably priced when weighed against the cost of multiple cases of malaria. Ideally, subsidized nets would be targeted to low income groups unable to afford commercial nets.

- Because brands of nets were generally unknown, commercial players will need to develop and market strong brands of nets that are associated with the characteristics that consumers want.
- The proportion of children under five and pregnant women sleeping under nets in net-owning households was moderate. Promotional and educational efforts are necessary to encourage net use by children under five and pregnant women.
- Given that consumers slept under nets only approximately half of the year, behavior change strategies are needed to encourage year-round net use and address any barriers to doing so.
- The concept of treating nets with insecticide was not well known, especially in far rural areas and among respondents from lower SES households. Net treatment rates were low; few nets were treated after purchase and even fewer were re-treated on a regular basis. It is essential to make net treatments available and promotional efforts are needed to raise treatment rates. Such a campaign can build on respondents' positive reaction to the concept of ITMs, particularly emphasizing the effectiveness of net treatment in killing/repelling mosquitoes and other insects — highly valued attributes of mosquito control products that are not currently associated with nets. A long-lasting net would help to overcome the challenge of getting people to re-treat nets, but as long as other nets are used, re-treatment will be necessary.
- Insecticide treatments for nets were obtained from both the public and private sector. In rural areas, however, treatments were obtained largely from the public sector, whereas in urban areas, no treatments were obtained from the private sector. A key challenge will be to increase involvement of the commercial sector in the production and distribution of net treatment in all areas, but especially in rural ones. Brands of net treatments were generally unknown. Strong branding of net treatments that have the attributes that consumers desire is encouraged as well.
- Over two-thirds of nets that had been washed were washed at least once a month. Over one-third of washed nets were washed weekly. Promotion efforts must address how often nets should be treated/re-treated as well as washed in between treatments. Long-lasting treated nets must be able to withstand frequent washing.

### **Consumer net preferences**

- Consumers preferred the net shapes they most currently owned (round/conical and rectangular). Most consumers preferred king size nets, but currently most own double nets. Product development should take into consideration consumer preferences for net shape (round/conical), size (king) and color (light-colored nets of different colors — light green, dark blue, pink, light blue) to raise sales and enhance strength of brand. (It should be noted that although no qualitative research was conducted in Mozambique, NetMark qualitative research in other countries showed that consumers prefer conical nets because they are easier to hang but they prefer the roominess of a rectangular net. If a rectangular net that hangs from a single point could be devised, it would combine two features that consumers like.) However, product modification should be addressed in light of any cost increases they would involve.

## 6.4 OTHER MOSQUITO CONTROL PRODUCTS

### Awareness of mosquito control products and methods

- Awareness of commercial insect control products — other than mosquito nets — was moderate overall. Use of commercial products was low but frequency of purchase fairly high among the few who did use them. Use of aerosols and coils was higher in urban than in rural areas and was particularly high in the Maputo site. The fact that many urban and rural dwellers know about and use commercial insect control products is favorable for net and insecticide treatment promotion. In addition, the fact that some consumers currently spend significant money on aerosol sprays is favorable for ITM promotion and sales. Promotional efforts should emphasize the insecticide characteristics of treated nets (e.g. killing mosquitoes and other insects), which are likely to have strong appeal to consumers. In addition, efforts should stress that use of insecticide treated nets is more economical in the long run than use of aerosol sprays.
- Consumers reported that coils (which can be obtained in packs or individually) were generally bought in markets. Aerosol sprays were generally purchased in general shops and markets. The fact that a large proportion of commercial insect control products such as coils and aerosols are bought in general shops and markets, as are the majority of nets, shows that the insect control market is not specialized among traders and that nets and ITMs can be sold together with nets in these commercial settings.

### Perceptions of mosquito control attributes, products, and brands

- The most highly valued attribute that consumers wanted in an insect control product was that it kills mosquitoes, kills other insects, and reduces malaria. They also wanted a product that keeps mosquitoes away for a long time, is a long-term solution to mosquito problems, and keeps mosquitoes away while sleeping. While consumers rated sprays/aerosols most highly on killing mosquitoes and other insects, mosquito nets were rated highest on keeping mosquitoes away for a long time, keeping mosquitoes away while sleeping, being safe to use around children, being a long-term solution to mosquito problems and reducing malaria. The fact that consumers strongly value the key attributes that ITMs deliver and that nets are already associated with many of these attributes is very positive for ITM promotion and sales. ITM promotion activities should highlight the fact that treated nets kill mosquitoes, kill insects other than mosquitoes, are a long-term solution to the mosquito problem, reduce malaria, keep mosquitoes away while sleeping, and are safe to use around children. Branded nets should stress that they are a high-quality and effective brand.

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